THE OIL WEEKLY

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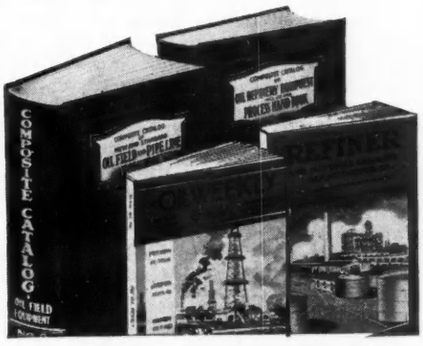

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The Oil Man's Calendar

APR.	
13–15	**Petroleum Industry Electrical Association, Rice Hotel, Houston.**
13–15	**National Petroleum Association, Cleveland, Ohio.**
14–15	**A.P.I., Eastern District, Division of Production, William Penn Hotel, Pittsburgh, Pennsylvania.**
17–21	**American Chemical Society, Dallas, Texas.**
19	**A.P.I., Division of Production, Pacific Coast District, Spring Meeting, Biltmore Hotel, Los Angeles.**
19	**Western Petroleum Refiners Association, Hot Springs, Arkansas.**
28–29	**Sectional-Regional Transportation & Maintenance Meeting, Society of Automotive Engineers, Cleveland, Ohio.**
MAY	
9–12	**American Gas Association, Natural Gas Department, New Orleans, La.**
11–13	**Natural Gasoline Association of America, Hotel Tulsa, Tulsa.**
12–14	**National Oil Scouts Association of America, Tulsa, Oklahoma.**
14–21	**International Petroleum Exposition, Tulsa, Oklahoma.**
23–25	**A.P.I., Mid-Year Meeting, Allis and Lassen Hotels, Wichita, Kansas.**
27–28	**Seventh Annual Petroleum & Natural Gas Conference, Penn. State College, Penn. Grade Crude Oil Assn., and Penn. Natural Gas Men's Assn., State College, Pennsylvania.**
JUNE	
4	**Illinois-Indiana Petroleum Association, Sixth Annual Conference, Robinson, Illinois.**

Contents « March 28, 1938

Volume 89, Number 3

The Changing Panorama.....25 and 26
General News.....28 to 34
Allowable Picture 28
Oil in the Courts..... 29
Labor Situation 29
Mexican Expropriation 30
Southwest A.P.I. 32
Western Metals Congress..... 34
Men in the Industry's News.....173
Squeaks from the Bull Wheel.....217
Engineering and Technical..... 36
Well Treatment After Perforating..... 36
BY BRUCE BARKIS
Ark-La-Tex Section..... 43
Ark-La-Tex Today and Tomorrow..... 45
BY HARRY D. EASTON, JR.
Ark-La-Tex Production 56
BY L. J. LOGAN
History of Arkansas..... 68
BY GRADY TRIPLETT
Schuler 72
Arkansas Performance Record..... 88
BY FRANK B. TAYLOR
History of North Louisiana..... 92
BY GRADY TRIPLETT
Rodessa 98
Cotton Valley 108
Lisbon 120
North Louisiana Performance Record.....128
BY FRANK B. TAYLOR
History of East Texas.....131
BY GRADY TRIPLETT
East Texas 134
East Texas Well Density.....142
BY H. H. KING
East Texas Deep Tests.....144
BY H. H. KING
East Texas Performance Record.....149
Index to Field Histories.....152
Markets and Statistics.....177
Pipe Line News.....183
Index to Field Developments.....187
New Products and Manufacturers News.....215

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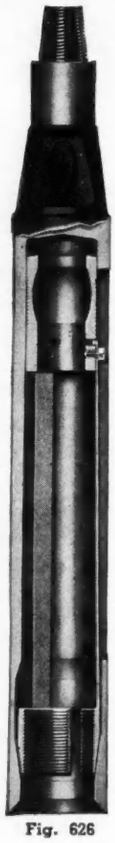

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LOOKING AHEAD

WITH THE EDITOR

Permian Presents Production Problem . . .
Drilling Time Record Important .
Drilling in the Gulf of Mexico . .

DRILLING and production problems of the Permian Basin, ranked as one of the most prolific oil reserves in the world, are many and a number of them are peculiar to the basin. All drilling there is "hard digging" and the reservoirs under exploitation include combined active water and gas drive types, gas drive types and types requiring artificial lift at discovery.

Due to the fact that remaining recoverable reserves of the area are estimated at two billion barrels, readers will look forward to presentation in an early issue of Wilfred T. Doherty's "The Permian Basin and Its Drilling and Production Problems."

MAX DAVID of Landreth Production Corporation, Midland, Texas, believes there is a close relationship between drilling time, or speed, and well potential in the Goldsmith pool and that drilling time can be used to determine casing points, depths, method of acidization and the placing of nitro shots. He says the keeping of drilling time records costs practically nothing. A complete discussion of the subject will be contained in an early issue of THE OIL WEEKLY.

DISCOVERY of a new oil field recently off the coast of Louisiana will intensify the already considerable technical interest in marine drilling. Hence the article, "Marine Drilling on the Gulf Coast," by I. W. Alcorn, division petroleum engineer of Pure Oil Company, Houston, will be timely. THE OIL WEEKLY *will publish it in a forthcoming issue, probably that of April 4. The author goes into typical drilling locations in submerged areas, offshore and inland, and lists operating difficulties encountered in such operations, with comments on foundations and equipment applicable to various types of drilling sites.*

The changing panorama

DEPRESSION conditions will be more strongly felt in the oil industry in April, and production will be further affected by efforts to liquidate oversize supplies already above ground, it is predicted by the Bureau of Mines in its monthly forecast.

Probable output of crude will be at the lowest point since last February, if actual production hits the forecast level of 3,361,700 barrels a day.

Recent developments in Europe may bolster up foreign demand for oil and gasoline, the bureau suggested, but admitted that the net effect is unpredictable at this time.

Gasoline Market Improves Further

Despite the relatively low levels of petroleum demand, with the market requirements running only slightly above last year's levels, some encouragement has been offered the oil industry lately, through the continuing improvement of the gasoline market.

Gasoline prices at Mid-Continent refineries last week were from ⅛ to ¼ cent a gallon higher than one week previously; and those gains had been preceded by earlier advances of ⅛ cent on some grades and in some districts.

Brisk demand has been accounted for partially, however, by exceptional buying in anticipation of the increased freight rates, with purchasers anxious to move supplies to consuming centers before effectiveness of the higher rates. That situation, as well as some seasonal increase in conumption, led to the recent bidding up of the gasoline prices.

Oil Burner Shipments Down

Fuel oil consumption has been disappointing lately, and prospects for future use are not encouraging, in view of recent statistics on sales of oil burners.

The Bureau of the Census has reported that 6338 oil burners were shipped by manufacturers in January, 1938, compared with 9274 in January, 1937, and with 7712 in January, 1936.

These figures refer to burners used for heating homes, apartments, office buildings, churches, and theaters; to some industrial installations, as in heat treating furnaces and industrial ovens; and to equipment for generating steam for power.

Recovery of Mexican Properties Sought

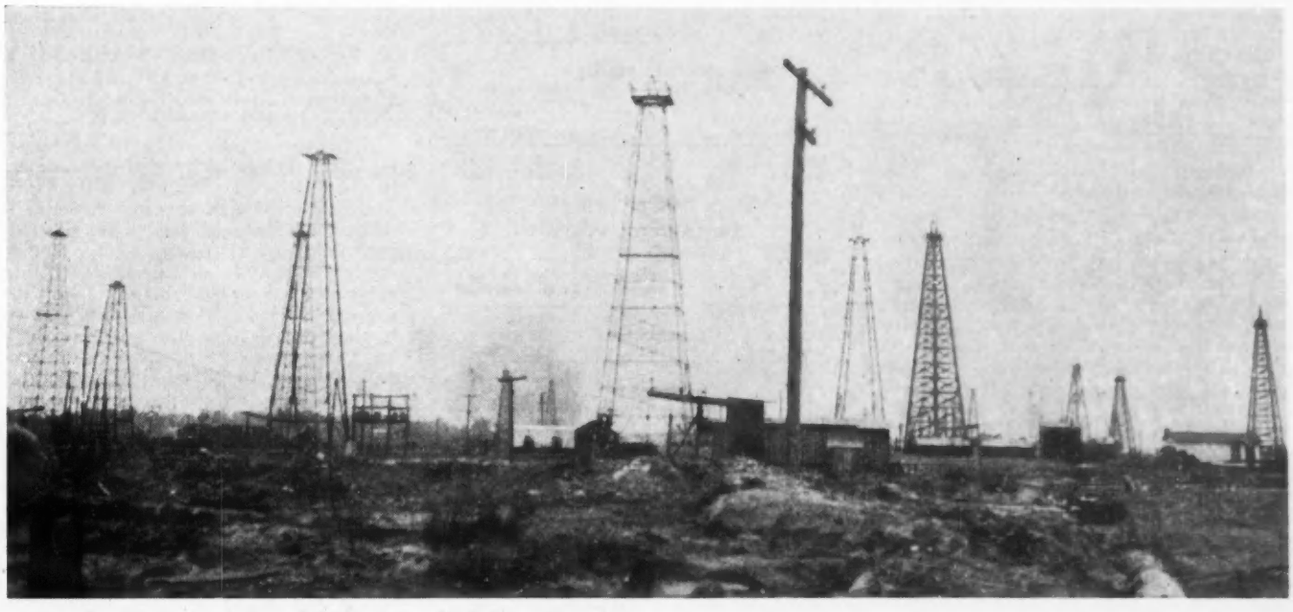
Despite the seriousness of the recent events in the controversy between Mexico's organized oil workers and the Mexican government on one hand and the foreign-controlled oil companies on the other, the companies have clung to the hope that the dispute eventually might be settled without disaster to them.

This hope was reflected in the action of the companies in immediately undertaking a legal and diplomatic fight to regain control of their Mexican properties, after Mexico's President Lazaro Cardenas promulgated his expropriation decree March 18. In accordance with the decree, the government confiscated the oil company properties, promising to pay for them in 10 years. This drastic action was taken on the grounds that the companies had rebelled against the Mexican Supreme Court, after the court ordered the concerns to pay the oil workers specified wages.

Will Contest Validity of Decree

Attorneys for the foreign oil companies planned either: (1) to start injunction proceedings against the expropriation decree, or (2) to ask the Mexican Su-

Orange field. Orange County, which was discovered in 1913, is developing into one of the most active fields in the Texas Gulf Coast. Recent discovery of production on the southwest flank has brought six rigs into operation in this area.



preme Court for outright revocation of the decree. It was stated that the companies would have a 15-day period in which to file, under the expropriation law.

It was believed they would contend that the expropriation law was unconstitutional and that there was no legal justification, therefore, for the seizure of the properties.

Diplomatic Action Second Recourse

It was indicated, meanwhile, that the second recourse of the oil companies, in event of failure of satisfaction through Mexican law, would be the seeking of international arbitration.

The Controversy in Review

The Mexican dispute began over a year ago, when the workers' syndicate on November 3, 1936, issued demands for increased wages and other workers' benefits. A strike eventually was called May 28, 1937, after unsuccessful negotiations, and on June 10, 1937, the strikers agreed to an arbitration of the dispute.

Arbitrators on August 4, 1937, submitted their report, which called for specified wages and benefits. The oil companies objected that they could not meet the terms of the report. But the government ordered the companies to provide the proposed benefits to labor. Insisting on their inability to make the larger payments, the companies appealed to the Supreme Court of Mexico. The court on March 1, 1938, rejected the appeal.

Petroleum for Generating Electricity

Production of electricity by water power in the United States showed a considerably larger increase in 1937 than did similar production by the use of fuel.

And among the fuels, gas showed a better gain than coal; but coal had a better record than oil, which was the only source of electricity to show a decline in use.

The Federal Power Commission reported that the production of electricity in 1937 reached a new all-time peak of 120,996,000,000 kilowatt hours, an increase of about 9 percent over 1936.

The production of electricity by the use of water power was approximately 13 percent more in 1937 than in 1936, and amounted to 36 percent of the total.

The total production of electricity by the use of fuel was 6 percent larger in 1937 than in 1936. The consumption of gas in generating electricity in 1937 was 10 percent larger than in 1936, while the gain in use of coal for this purpose was 7 percent higher. Similar consumption of oil, in contrast, showed a decrease of 1 percent.

Drilling

CONTINENTAL Oil Company's wildcat in California continues to add to the world's depth record, having reached 14,629 feet. The second deep zone well in Rosecrans field was good for 1200 barrels.

A wildcat southwest of Calvin, Hughes County, Oklahoma, made 1132 barrels of Viola lime oil in 5¾ hours when tested at 5168 feet. Another in Okfuskee indicated it might open a Prue sand field when it showed oil in that formation at 2812 feet.

Two wildcats on the western edge of Kansas loomed as pool openers. A third, 8 miles southeast of St. John pool in Stafford County looked like a pool opener also. Silica was extended three-quarter mile west.

In the Texas Coast, Eureka gas field was turned into an oil field by a successful completion. Fairbanks recorded an 8000-foot extension.

Southern Louisiana reported East Baton Rouge Parish's first oil field when a well was brought in near the state university campus.

An outpost a half mile east of North Sweden's 5500-foot sand limits in Southwest Texas showed for a producer; a west extension for the Pettus sand part of the field loomed at the same time. Ezzell field of McMullen and Live Oak counties was being extended a mile southeast and getting a new sand. Jackson County got a new field seven miles north of Edna. Alfred field was extended northeast and Turkey Creek got a new sand.

In West Texas a shallow oil strike was recorded in Crockett County and Slaughter field in Hockley County was extended.

Market briefs

Outlook—Improvement of gasoline market is encouraging.

Crude Markets—Prices continue steady.

Refined Oil Markets — Gasoline prices advance further.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
March 19	3,433,550	3,080,000
Previous week	3,382,100	3,100,000
Year ago	3,448,150	3,095,000

CRUDE STOCKS

Date	Crude Oil (Barrels)
March 12	305,566,000
Week ago	304,527,000
Year ago	290,613,000

REFINED OIL STOCKS

Date	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
March 19	93,192,000	122,067,000
Week ago	93,084,000	122,818,000
Year ago	81,623,000	97,287,000

DRILLING

Period	Wells Completed
Past week	497
Previous week	422
Year ago	464
Year Total:	
This year	5,919
Last year	5,959

Technology

THERE are many wells in which an engineering analysis will show that proper treatment method after perforating will remove obstruction to the free entrance of oil and result in increased recovery. On page 36 Bruce Barkis starts an article titled "Well Treatment After Perforating" which discusses briefly present cleaning methods. He says that little is known regarding the material removed from the well during cleaning, but that keeping detailed records during cleaning, together with records of conditions before and after perforating will permit a better evaluation of cleaning operations. The paper was presented March 25 before the Spring meeting of the Southwestern District of the American Petroleum Institute, Division of Production, in Fort Worth.

Starting on page 43, a broad technological concept of operating conditions in the Ark-La-Tex region of the United States is presented through the medium of several feature articles on that area and fields of that area. Almost every conceivable type of operating problem is presented in the region; and it is logical to assume it will also be the birthplace of new operating problems of tomorrow. Hence, any engineer, whether he be a production man, a drilling man, or an exploration engineer, will find in that section which this issue of THE OIL WEEKLY features information of interest and use. Not to mention other spots, such places as East Texas, Rodessa, Schuler, Cotton Valley and Lisbon are subjects of special features. Then, too, there is the valuable condensed historical sketch of each field and prospect in the region.

Labor Radicalism Run to Seed

THE situation in Mexico, where the government has "taken over" foreign owned oil properties because the companies would not acceed to labor demands which were preposterous, is an excellent illustration of what happens when government either is too weak to withstand unreasonable demands of labor, or when government encourages labor beyond the bounds of common sense.

Governments elsewhere may well take a lesson—because Mexico's troubles are only starting, and the labor syndicalists and the government there, who have so enthusiastically taken over properties and a job which they can neither pay for nor operate, are due to learn a bitter lesson.

If this statement be disputed let it be remembered that not only were the foreign owned and operated oil companies already paying a wage scale far in excess of the ordinary wage scales of Mexico, but that employes of foreign owned and operated companies were actually receiving about twice as much pay as were the employes of the government-sponsored, Mexican-owned and operated company. And the profits of this government-sponsored enterprise fully illustrated the difficulty of management of such enterprises.

What will happen in the way of state department action from Washington or London or The Hague remains to be seen. Mexico can hardly expect to take over an entire industry and get away with it. And payment in bonds or paper already declining in value in no way lessens the iniquity of the expropriation.

BUT this isn't the big problem. The Mexican government might string out negotiations over a long period on the question of payment—but the problem which the government and its partner in the seizure now have is that of finding a market for the oil which may be produced, the question of credits for money to operate on, the question of operating personnel, and, most important of all, the labor problem itself. Whatever bureau or organization attempts to operate the oil industry in Mexico has its hands full.

There is a material difference between the estimates of the oil companies and the labor representatives as to the actual cost of putting into effect the wage increase demanded. The lowest estimate is $7,000,000 and the highest is $12,000,000 per annum. Mexico's exports in 1937 ran 23,000,000 barrels, and domestic consumption was 20,000,000 barrels. If Mexico can continue to export 23,000,000 barrels of oil annually, which is out of the question, even then the burden imposed on the Mexican consumers of petroleum products will be increased a minimum of $3,700,000 annually, while 16 cents per barrel will have to be added to the cost of the oil at the wharf for export—all to take care of a group of labor syndicate employees already receiving a rate of pay out of proportion to that of the rest of the population. The Mexican people themselves cannot possibly relish this.

These figures pre-suppose that the general overhead and management costs of producing the oil will be the same under government supervision as under private management, and observation on past experience indicates that such expenses will be higher under government control than under private management.

Not only will the Mexican government face accession to the demands on pay—and we assume that the government will immediately pay the new wage scale or get some of what the government has just handed the oil companies, but conditions imposed in the labor demands on the oil companies are such as to make efficient operation impossible.

MEXICO herself is not in good financial position. Radical measures and leanings have had the same effect there that they have wherever they are tried out. Capital for enterprises disappears. Certainly Mexico is in no position to finance the oil program on the scale that it has been going. And foreign capital would be silly indeed if it trusted itself to Mexico again. This applies not only to oil but to other enterprises, because any foreigner who would be willing to invest money in Mexico under present conditions should have his head examined.

We predict that oil affairs in Mexico will be in a terrible shape within a year, unless the matter is straightened out sooner. But what will happen to the properties of the companies while those properties are in the hands of irresponsible syndicalists isn't hard to guess.

Allowable Picture

Bureau's April estimate designed to reduce stocks . . . Warning of federal control again . . . California revamps curtailment plan.

DEPRESSION conditions and possibilities of liquidation of excessive stocks are expected to result in a further curtailment of crude-oil production in April, it is indicated by the monthly forecast of the Bureau of Mines placing estimated demand for the coming month at 3,361,700 barrels a day.

The forecast for April was 29,900 barrels a day under that for March and 137,600 barrels less than the actual daily production for April, 1937, although 118,700 barrels above the forecast for that month.

The April forecast was the sixth consecutive report in which a decline was predicted and represents a drop of 206,400 barrels from the peak prognostication of 3,568,100 barrels for October of last year.

The bureau pointed out that its latest reports show that crude production during the five weeks from January 29 to March 5 averaged 3,341,000 barrels a day, during which period crude oil stocks increased 241,000 barrels net, there being an increase of 542,000 barrels in domestic grades and a decline of 301,000 barrels in foreign crudes. Less the increase in domestic stocks, demand for domestic crude oil during the period was 3,326,000 barrels daily.

For April, the bureau estimates a domestic motor fuel demand of 44,500,000 barrels, or 2.5 percent above actual demand in April, 1937. Exports are placed at 3,300,000 barrels, 300,000 barrels less than the March estimate but 513,000 barrels above the actual exports in April of last year.

Stocks of finished and unfinished gasoline on January 31 were 85,873,000 barrels and, according to statistics of the American Petroleum Institute, increased about 5,800,000 barrels during February, bringing them to approximately 91,700,000 barrels at the close of that month. Stocks were further increased by 1,750,000 barrels during the first 11 days of March, it was pointed out, indicating that they will be well above 93,000,000 barrels by the end of this month unless reductions are accomplished in its latter days.

"Crude run figures of the A.P.I. show declines in recent weeks," it was commented. "Part of the declines was due to plants closing down because of unsatisfactory market conditions, but a desire on the part of the others to reduce runs to improve inventories is also evident. In April the factors tending to curtail runs will probably offset the seasonal increase. The estimated decline in gasoline stocks for April of 2,500,000 barrels, while high compared with past years, is therefore based largely on the assumption that crude runs will not greatly exceed 3,150,000 barrels, the average of recent weeks."

Benzol and direct sales and losses of natural gasoline are estimated at 900,000 barrels, requiring an estimated production of gasoline of 44,400,000 barrels, which the bureau recommends be allocated among the several districts as follows:

Gasoline Allocations

East Coast, 6,420,000 barrels; Appalachian, 1,520,000 barrels; Indiana-Illinois, 7,630,000 barrels; Oklahoma, 2,630,000 barrels; Kansas, 2,390,000 barrels; Texas inland, 3,430,000 barrels; Texas Gulf, 10,530,000 barrels; Louisiana Gulf, 1,380,000 barrels; North Louisiana-Arkansas, 910,000 barrels; Rocky Mountain, 1,110,000 barrels; California, 6,450,000 barrels.

With natural gasoline consumption at refineries in April estimated at 6 percent of the total gasoline required, or 2,670,000 barrels, and the yield of straight-run and cracked gasoline placed at 44.2 percent, compared with 43.3 percent in March, an estimated straight-run and cracked gasoline production of 41,730,000 barrels is foreseen, giving refinery crude-oil requirements of 94,400,000 barrels, or 3,147,000 barrels a day.

Foreign runs to stills are estimated at 2,100,000 barrels, 100,000 barrels under the March estimate, and the forecast for crude exports has been reduced to 6,050,000 barrels, in accordance with forecasts from exporters which indicate smaller shipments for all districts except California.

"Recent developments in Europe may tend to increase exports of crude oil, but the net effect is unpredictable at this time," the bureau commented.

The estimate for crude oil burned as fuel and losses is 2,500,000 barrels, and on the basis of these various factors daily average for April is estimated at 3,361,700 barrels, the allocation by states, compared with the forecast for March and actual production in January, is shown in an accompanying tabulation.

Estimated Crude Oil Requirements by States[1]

(Daily averages in barrels)

State	Forecast, April, 1938	Forecast, March, 1938	Actual Production, January, 1938
Texas	1,329,800	1,344,900	1,317,700
California	698,700	694,600	709,900
Oklahoma	526,500	547,700	561,600
Louisiana	239,800	239,400	253,000
Kansas	173,000	176,700	183,300
New Mexico	106,000	105,100	105,000
Michigan	51,400	51,600	50,500
Pennsylvania	50,300	49,700	50,500
Wyoming	46,600	46,400	47,300
Arkansas	40,000	38,200	41,500
Illinois	34,700	30,700	36,400
New York	13,700	13,800	14,300
Kentucky	13,400	13,900	13,300
Montana	12,700	13,300	12,100
West Virginia	9,500	9,700	9,400
Ohio	8,800	9,100	8,000
Colorado	4,600	4,500	3,700
Indiana	2,200	2,300	2,100
	3,361,700	3,391,600	3,419,600

[1] The estimates in this table have been calculated as the market demand requirements for the months stated and are not intended to be calculations of daily average demand for the current year or for any period other than the months stated. As no changes in crude-oil stocks are involved in these estimates, they represent demand rather than production.

Threat of revival of government control idea

Sharp warning that the oil industry must take prompt steps to cope with the excessive stocks now held above ground was sounded this week by Secretary of the Interior Harold L. Ickes, an indication that administration officials are highly concerned over the situation.

"Crude oil and gasoline stocks are getting too high for comfort, but there is nothing we can do about it," the secretary declared March 24 in an appeal for a reduction in both production and refining for the purposes of liquidation.

Pointing out that supplies can be better conserved underground than above, the secretary revealed that recent reports to Washington have been disquieting, particularly in view of lagging industry and depressed economic conditions.

Washington officials thus far have refrained from discussions of federal control of the industry, but the legislation sought to that end by the Interior Department several years ago is still in the files and may be revived, it has been indicated, if the industry itself fails to take steps to prevent the chaos which is foreseen if above ground stocks continue to mount.

Arkansas reduces well allowable at Schuler

The Arkansas Board of Conservation last week reduced the per well allowable in the lower Marine (Jones) horizon of the Schuler field, Union County, to 650 barrels daily for April, a reduction of 50 barrels from the March allowable. This horizon in Schuler now has 21 oil producers.

The Miller County end of Rodessa was given the same allowable as March but the board decided to reduce the allowable of wells in that area having excessive ratios and those incapable of making their allowables, to a figure indicated by monthly reports.

A report was submitted by C. H. Thigpen, engineer for the board, requesting an increased gas/oil ratio for Miller County to compare with Louisiana and Texas.

Louisiana allowable for April is increased

The allowable for the Louisiana side of Rodessa for April will remain at 42,000 barrels daily, the same allowable as March, the Louisiana Conservation Commission has decided. The usual augmented field allowable of 66,000 barrels will also remain in effect.

The Lisbon field was given an increase of 1000 barrels for April, the new allowable being 11,000 barrels. Cotton Valley, Webster Parish, whose

lower Marine 8000-foot level is classed as a gas field, but which now has 6 oil producers in the Travis Peak at 5500-5900 feet, was given its first oil allowable for April, a total of 2800 barrels. Heretofore Travis Peak wells have been held to 300 barrels daily. The total for North Louisiana for April is 75,800 barrels, an increase of 3800 barrels. South Louisiana was given an allowable of 175,475 for April, as compared to 174,755 for March. Louisiana's total allowable for April is 252,275.

William G. Rankin, Louisiana Conservation Commissioner, has under advisement a request by a number of Lisbon field operators to change the present 20-acre space rule in that field to a 40-acre space rule. The requests were submitted at a hearing on the matter in New Orleans March 22.

New basis for curtailing California excess output

The new basis for oil curtailment for the Wilmington oil field that is expected to steady the current crude market, is already in effect.

Under the new set-up, wells that have been producing 2000 barrels per day and have been capable of more, will be on a 1000-barrel basis, and any new gusher regardless of its potential, shall not exceed 2500 barrels per day.

As a result of this curtailment the Long Beach harbor area of the Wilmington field is holding back flush production at the rate of 38,000 barrels per day and a sharp curtailment of production will occur in the Lakeview pool at Maricopa through a voluntary five-day shut-down in the field beginning April 1.

On March 15 the daily output of California oil fields reached 768,693 barrels, the largest daily yield since October, 1929. This record, in spite of the recent curtailment, is explained as the result of a high average which prevails at the middle of every month and that cutbacks in certain fields later in the month average the month's yield down from these occasional highs.

A definite step to bring further oil curtailment in the Wilmington-Long Beach oil field took place this week when operators from that field met with L. L. Aubert and Lawrence Vander Leck to discuss the problem. Town-lot producers in Wilmington were asked to meet with Aubert and proration officials in an endeavor to bring wells in that area down to a desired level.

Several days ago the producers in the so-called "hot spot" area, involving 18 wells, agreed to curtailment. As a result these wells, which were producing 93,000 barrels a day, have been choked down to only 27,000 barrels a day. These wells are situated east of the entrance channel of Long Beach harbor and have been the most prolific producers in this field since its development.

In fact, the program has been so effective that the wells involved are producing less than the desired quota. Hancock Oil Company, Bankline Oil Company, General Petroleum Corporation, Westgate-Greenland Oil Company, Superior Oil Company and Long Beach Oil Company control these 18 wells.

[*Continued on page 176*]

Oil in the Courts

Madison trial revived with oral argument seeking arrest of judgment . . . Another anti-trust action will not be heard till fall; same defendants involved.

A NEW phase of the legal battle between the federal government and the oil industry which reached a climax in January with conviction of 16 major companies and 30 individuals on anti-trust law charges will open before Federal Judge Patrick T. Stone in Madison, Wisconsin, Monday, March 28. It will center on oral argument of motions filed on behalf of members of the industry convicted by a jury of Wisconsin farmers and small town business men which seek an arrest of judgment, a new trial or a court order setting aside the verdicts.

Should defense attorneys be unsuccessful in their efforts to obtain a favorable ruling on one of the motions now before the court, an appeal to the United States Circuit Court of Appeals at Chicago will be taken, based in part upon the court's instructions to the jury in which, calling attention to alleged illegal spot market purchases of distress gasoline from independent refiners by defendant companies which the defense maintained was done with government knowledge and approval, the court said, "even if you should find that some government officers knew of or acquiesced in such combination and conspiracy, such knowledge or acquiescence would not excuse the violation of the Sherman Act, if you find that the law was violated."

In the petition for an arrest of judgment, the defendants declare they were deprived of their rights as guaranteed by the sixth amendment to the constitution in being denied the right of trial in the district in which the alleged crime was committed, it being alleged that the indictment fails to show a violation of the Sherman Act in the western district of Wisconsin. The motion for a new trial lists 13 types of errors which the defense maintains were committed by the court and the prosecution during the four-month long trial that prejudiced the jury and deprived defendants of a fair and impartial trial.

Dependent in part upon disposition of the motions to be argued this week will be the trial date of another indictment charging Sherman anti-trust law violations in which most of the same companies and individuals are charged with conspiracy to restrict jobber margins through use of uniform contracts. Government attorneys are anxious to bring this indictment to trial, believing their case even stronger than the one in which they obtained a conviction in January. Judge Stone has indicated he would not call the new case before fall.

If the jury verdicts are permitted to stand, convicted companies will be subject to fines up to $5000 each, and individuals to fines up to $5000 or one year in jail, or both.

Labor Situation

Complete hearing in Humble case at Baytown . . . Texas Secretary of State files Nederland answer . . . Pennsylvania 44-hour labor law is held void.

HUMBLE OIL & REFINING COMPANY'S Baytown hearing finally came to a close last Thursday. This marked the end of numerous cross examinations in the charges of unfair labor practices filed again the company by the C.I.O.-affiliated International Oil Workers Union. The hearing was conducted by J. C. Batton trial examiner of the National Labor Relations Board, who will also hear charges of the C.I.O. against Humble Oil & Refining Company at the company's Ingleside refinery at Corpus Christi, Texas, this week.

The Baytown hearing ended early in the afternoon of the sixteenth day of testimony-taking, with three rebuttal witnesses. The time of hearing many other witnesses was saved by stipulations of opposing counsel as to what they would testify. Examiner Batton expressed his intention not to pass upon motions to dismiss the charges, made in the previous week and renewed late Thursday by Hines Baker, company attorney conducting the defense, until all evidence in the case had been received. However, he emphasized that no one should assume from that statement that he would reserve his decision on the Baytown charges until the Ingleside hearing had been completed. In this connection he explained that reservations have been made by the board and respondent, relative to going into matters pertaining to general policies of the company. "Until such mat-

ters have been disposed of I don't intend to dispose of the motions," Batton explained.

One of the last witnesses for the company stated that, according to his knowledge, it was the definite purpose of the company not to sponsor or discourage any type of organization, and that there was to be the utmost freedom on the part of the employes in their choice, without any effort on the part of the company to direct, suggest or coerce them. He did not recall any instances in which the company had departed from that policy. From his statement it was gathered that 90 percent of the men in one particular department openly favored the employees federation without any influence on the part of the company. This was in accordance with statements taken previously from a number of witnesses, an important factor, as the C.I.O. had charged the company of sponsoring the employees federation and discouraging employees to join the Oil Workers Union.

In the final hearing Thursday, Examiner Batton expressed his appreciation for the use of that city's gymnasium and was gratified with the wide public attendance, through which a better understanding on the part of the people of the labor boards workings has been made possible. The exhibits

[*Continued on page 182*]

Mexican Expropriation

Legal recourse may be possible for oil companies . . . Government can run $400,000,000 industry, Mexicans say; others disagree . . . State Department aid asked.

GENERAL opinion late in the week regarding the oil situation in Mexico embraced these speculations:

1—One man's opinion is as good as another's as to whether the oil companies might eventually be called back into Mexico to operate as their own properties expropriated by presidential decree lately.

2.—That Cardenas could not reverse his stand without losing political standing with the labor syndicates.

3.—That he could not go ahead without penalizing the Mexican people financially.

Talent Available

As to whether Mexico has enough technologists and technicians to run the expropriated industry, there are two directly opposed schools of thought: Some of the Mexicans are firm in their faith in the capability of home talent. Foreigners who have been handling administrative and technical problems of the oil companies down there and some of the Mexicans familiar with the ramifications of oil company operation are equally firm in their conviction that the number of Mexicans trained to handle such matters is too small for the size of the industry in Mexico, which is accredited with having produced some 43,000,000 barrels in 1937.

Ask for Aid

In this connection, it is a matter of record that a number of independent operators flew to Mexico last week at the invitation of the Mexican government and were asked to lend their aid in exploitation of oil properties expropriated from the foreign controlled campanies. One of them was quoted upon returning as saying:

"I don't believe any American oil man is going to help them develop something they have taken from other Americans."

One man in Mexico says public opinion in the capitol city is strongly behind Cardenas. March 25 The OIL WEEKLY received a telegram from him reading in part:

"That the expropriated oil companies will never come back is the concensus of opinion (in Mexico City) in view of the unanimous national support of the Cardenas action. The companies have until April 5 to appeal to the supreme court concerning the expropriation decree, but thus far they have made no move in that direction.

"The declaration of Cardenas that the companies will be indemnified has enthused the Mexican public, many sectors of which have volunteered economic aid to the government to enable it to fulfill this worthily assumed obligation.

"It is expected that the 150,000,000 *pesos, currently about* $35,000,000 *U. S., awarded the workers as pay during the general strike last summer, will be deducted from the companies' indemnification. The companies have not yet contacted the government regarding the indemnification.*

"Work is continuing in the oil fields where only a few foreign workers remain, most of them having been removed to Mexico City by plane as a precautionary measure, and domestic distribution is normal as the government possesses full facilities, including railroad tankers, for that distribution.

"But the export phase has not been fully lined up, owing largely to a paucity of tankers. It is said that the government plans to build or buy tankers, both of which propositions would be costly, and the government is not very well off financially.

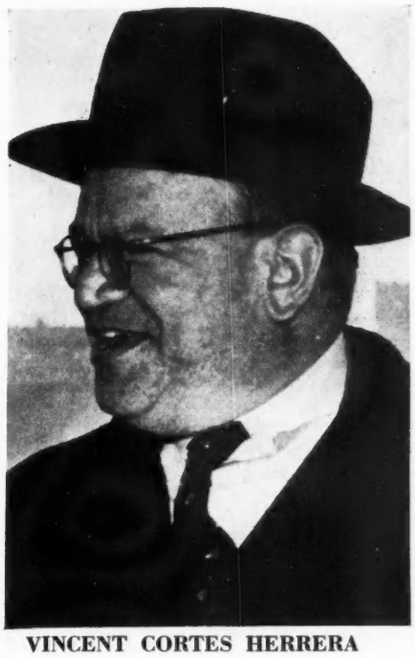
"The Mexican government expects to make important oil sales to Japan and Germany. Japan is expected to take delivery in her own tankers.

"But it is also indicated that both countries would want to swap their manufactured products for Mexican oil, and in view of the Mexican government's monetary position it desires cash for these

WHAT THE OIL COMPANIES MIGHT BE ABLE TO ESTABLISH BEFORE THE MEXICAN COURT

That the decision of the supreme court of Mexico on March 1 in the injunction case of the oil companies was not correct because:

1. **The award compelling the companies to meet the workers demands was issued by incompetent authority; that the action should have been submitted to the full labor board and not to Special Board No. 7; that this is a violation of Fraction III, Article 365, and Fractions I and II, Article 366, of Mexico's Federal Labor Law.**
2. **That the defendant companies were tried by a special tribunal and that such action was in violation of Article 13 of the constitution of Mexico and of Articles 499, 393, 394 and 395 of the Federal Labor Law.**
3. **That despite the fact that a new president of the Federal Labor Board was designated, Lic. Gustavo Corona continued trying the case and decided the controversy, he having been in effect designated as a special representative of the government to decide the matter. That this violates Article 13 of the Constitution which prohibits the formation of special tribunals.**
4. **That the voting upon the award was not in legal form and was in violation of Articles 535, 536, 537 and 539 of the Federal Labor Law.**
5. **That the award imposed benefits which were not subject matter of the workmen's petition and which were, consequently, incongruous with same and that it was in violation of three articles of the labor law.**
6. **That legally in Mexico the execution of labor contracts cannot be demanded and that such was in violation of two articles of the labor law.**
7. **That the boards do not have all-embracing powers in the decision of conflicts and that in assuming such there was a violation of four articles of the labor law.**
8. **That there exists no law or reason providing that the benefits granted by employers to their laborers have no limit other than the economic capacity of their employers.**
9. **That without legal powers to do so the board imposed upon the companies a collective labor contract which they have never been disposed to accept; that so doing was a violation of Article 16 of the Mexican Constitution.**
10. **That the award falsified the true economic situation of the companies.**



VINCENT CORTES HERRERA

transactions and does not want to supply oil for German machinery and chemicals or for Japanese silk underwear, toilet articles, etc.

"Nevertheless, the government is going ahead with its plans for lining up exports and in that regard is eyeing some California and Pennsylvania independent distributors."

Shortly after receipt of the above telegram a glance at the morning paper brought out that the peso, rated at 3.60 pesos for one U. S. dollar just before the expropriation decree, March 24 was being sold at the rate of 4.35 to 4.45 pesos per dollar. The same day some dealers in Mexico City had increased the meats as much as 50 per cent. A large dealer in imported food products increased all food products prices a flat 15 per cent.

Those Involved

In the beginning of the trouble, which resulted from failure to arrive at an agreement over a collective labor contract, the project of the collective contract was sent specifically to the following companies: Cia. Mexicana de Petroleo, "El Aguila,", S. A.; Huasteca Petroleum Company; Pierce Oil Company, S. A.; California Standard Oil Company de Mexico, S. A.; Petroleos de Mexico, S. A.; Penn-Mex Fuel Company; Stanford y Cia.; Richmond Petroleum Company of Mexico; Cia Exploradora de Petroleo "La Imperial," S. A.; Cia. de Gas y Combustible Imperio, S. A.; Mexican Gulf Oil Company; Mexican Sinclair Petroleum Corporation; Consolidated Oil Company of Mexico, S. A.; the three Cia. Naviera companies, one of San Cristobal, one of San Antonio, and one of San Ricardo; and Cia. Petrolera AGWI, S. A. Whether any of these were exempt from expropriation is not known.

Since the expropriation, press reports are that a few executives of some of the foregoing organizations are being held as hostages by the labor syndicates for alleged back pay.

Briefly stated, the chronological order of events leading to expropriation were these:

November 3, 1936, about 14,000 workers, represented by the labor syndicate, made demands for increased wages and benefits which they estimated would cost the companies $7,000,000 annually. The companies figured the demands would add $12,000,000 annually to the overhead. The companies refused the demands, the labor leaders threatened to call a strike, and President Cardenas intervened. After long, drawn-out negotiations between the companies and the syndicates, a failure to agree on a blanket contract resulted in a general strike May 28, 1937.

On June 10 the strikers agreed to leave matters up to a board of arbitration.

August 4 the arbitrators rendered their findings, which were rejected and attacked by the oil companies.

December 18 the arbitral verdict was issued, granting workers increases in pay and benefits which the oil companies said they could not pay and still remain in business.

December 31 the companies informed the workers they could not afford to accept the arbitral board's ruling and appealed to the Supreme Court of Mexico for relief. The court rejected the companies' appeal March 1, 1938, and Cardenas, on the grounds that the oil companies' attitude was a rebellious one, took over their properties. The next day officials of some of the oil companies involved issued protests.

Meanwhile, a number of things have happened since the surprise radio decree delivered at 10 p. m. March 18, delivered by Lazaro Cardenas, president of the Mexican republic, expropriated the $400,000,000 holdings of 17 foreign-owned oil companies.

Between midnight March 18 and noon March 19 all properties of the companies were taken over and Americans were not allowed to re-enter their offices, representatives of the syndicates blocking their paths. Some of the personnel of various companies, attempting to prevent syndicalists from occupying the offices until they presented proper authorization or credentials from the government, were subjected to threats of force.

The seizure of oil company properties extended in some instances to seizure of personal property of the employes also. Automobiles belonging to the employes personally were in some instances taken over along with trucks and automobiles belonging to the oil companies. When the employees objected they were informed the personally-owned cars would be returned if an investigation later on proved the cars really were personal property.

By March 20, Sunday, there was a run on filling stations by people fearing another gasoline shortage similar to that which existed during the 120-day strike in 1937. The result was that tank truck drivers in metropolitan areas had to work overtime in certain cases to keep the filling stations supplied with gasoline. One truck driver presented

WHAT THE LABOR SYNDICATE DEMANDED FOR MEXICAN OIL WORKERS

(Abstracted from demands made of 17 oil companies by "Sindicato de Trabajadores Petroleros de la Republica Mexicana)

1. Increases in wages and salaries from an aggregate of 30,920,000 pesos to 77,555,500 pesos per annum.

2. Increases in overtime payments from an estimated 5,071,000 pesos per year to 53,702,800 pesos.

3. Increase from 1,662,000 pesos to 9,719,300 pesos per year for increases in holiday and vacation compensation.

4. Increases on expenditures for medical attention, hospitalization, sickness, and accident benefits from 1,938,000 pesos per year to 8,848,080 pesos.

5. Increases in contributions to savings funds from 1,625,000 pesos to 11,324,130 pesos per year.

6. Increases in housing and/or rental allowances from 1,316,000 to 8,318,000 pesos per year.

7. It was estimated at the time of the demands of the syndicate originally that the oil companies were spending 1,758,000 on certain miscellaneous expenses. The demands would have raised this amount to 8,138,000 pesos per year and would have swelled the list of miscellaneous overhead costs to embrace costs of other prerogatives, including bonuses, recreation facilities, teachers and schools, company products at discount, ice allowances, expenses while on vacation, expenses of labor delegates and employees of the labor syndicate, etc.

The above seven demands did not include additional ones for pension reserves and pension increases. Nor did they include the demand for five hectares (12.35 acres) of farming land for each member of the syndicate.

The syndicate demanded non-syndicalized personnel be restricted to a bare skeleton of the normal executive organization.

Regarding closed shop, the syndicate demands would have invoked it so thoroughly that the syndicate would have had the exclusive right to hire and fire anyone up to, but not including, the general manager. In addition, the syndicate demands provided for a queer variety of the so-called "escalafon" (seniority system of promotion) which would permit men to be raised from one position to another without the slightest consideration as to training or competency to fill the higher position.

Increased overhead from the seven demands enumerated above would have amounted to 133,316,510 pesos per year, the oil companies estimated in the early days of the strife.

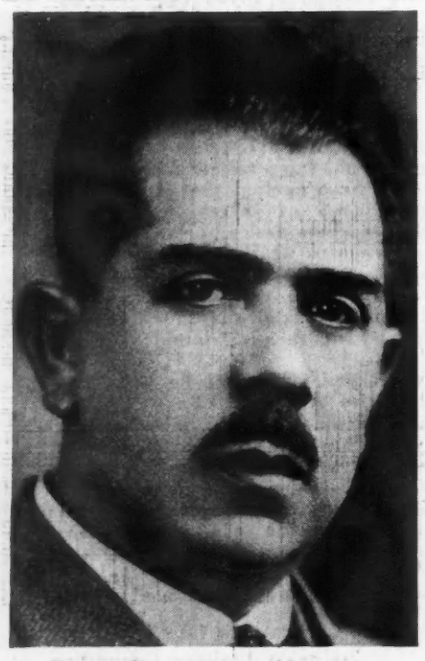
his time ticket for the newly appointed person in charge of such affairs to endorse the overtime. It is told the driver was informed there would be no overtime allowances until matters cleared up.

March 21 men who were employes of the oil companies prior to the expropriation and who remained on the job after the government took over properties of those companies are said to have received announcement of a 60 percent reduction in pay. When querried by THE OIL WEEKLY as to why this point had not been brought out in Mexican newspapers, one man stated that the government's organization for control of press and public relations had issued an ultimatum to the Mexican papers to the effect that they accept no statements from the oil companies for publication. A statement concerning the wage cut under government control, he said, would be construed as pro-oil company, even though the companies were no longer administrators of the properties when the cut was alleged to have taken place.

On March 10 Toledano, the labor power in Mexico today, was quoted in Mexico as saying he had communicated with John Lewis, the American labor leader of the C.I.O. group, with the idea of obtaining certain types of laborers to tide over the new administrators of Mexico's oil industry until sufficient Mexican personnel had been trained to carry on. Lewis is said to have denied receiving any such communication. Shortly after the expropriation decree Mexican press carried a telegram, purported to be from Lewis, sanctioning, in effect, the action of the government by saying the sender thought industry should abide by the laws of the land.

Four American oil companies, Huasteca Petroleum Company, Standard Oil Company of California, Mexican-Sinclair Oil Company and Penn-Mex Fuel Company, filed protests with the de-

[*Continued on page 180*]



LAZARO CARDENAS

Southwest A. P. I.

Greatest oil storehouse . . . Permian has peculiar proplems . . . East Texas pressure depends partly upon time . . . Marine drilling is newest problem.

THE Southwestern area of the United States, comprising the states of Texas, Louisiana, Arkansas and New Mexico, were termed the greatest storehouses of crude oil and natural gas in the world at the spring meeting of the Southwestern District of the American Petroleum Institute's Division of Production, held in Fort Worth last week.

Speakers also told those assembled that the reservoir pressure in the East Texas field depends upon both time and production rates, and that continued unrestricted water output was apt to have disastrous effects on the reservoir pressure, the future flowing life and ultimate recovery of the field; that employee-job training was the most important factor in successful accident prevention; that there has been an increased enrollment in vocational training work and a growing demand for special courses; that New Mexico's conservation laws are looked upon as a model by other states, and that there has never been any litigation whatsoever over its regulations.

In technical operating papers members learned that the drilling and production problems are many and peculiar in the Permian Basin Area; that the major problems in designing salt water gathering systems are to prevent corrosion and deposition of scale; that the difficulties of marine drilling are many and varied, and likewise the types of rigs in use; that while well cleaning methods now used result favorably, but little is known regarding the material removed from the well during the operation, nor regarding the free passage of oil through the area adjacent to pipe perforations at the producing zone; and that drilling time was being used successfully in the Goldsmith field in determining completion practices.

Southwest Leads Oil

Terming the Southwest the "greatest storehouse of petroleum on the globe," W. R. Boyd. Jr., executive vice president of the American Petroleum Institute, stated that there are nearly 10 billion barrels of known but unproduced crude oil in Texas, Louisiana, Arkansas and New Mexico today.

Production statistics, he pointed out, demonstrate how prone to err are those who cry the scare of scarcity and seek to create alarms for impending shortage in the nation's oil supply. In 1891 Dr. David T. White, of the United States Geological Survey, making what probably was the first survey of oil reserves, pessimistically reported that "Texas apparently had no real oil-producing possibilities." Continuing, he declared, that last year Texas alone produced more oil than the entire country produced in the first 32 years of oil history.

"We still are being forced to listen to the prophets of disaster. Only a few weeks ago it was publicly stated in Washington, D. C., that the oil reserves of this nation would be exhausted in November, 1941. Unfortunately, we cannot take these prophecies as lightly as they may deserve to be regarded. They are the vocal indications of the new trend in political thought toward socialization.

"The most recent non-political, nonpartisan, uninspired, and reliable estimate of the nation's oil supply was made public early in February by the Institute's Committee on Petroleum Reserves. This committee, after months of consultation with the best available engineering minds in the industry, placed proven reserves as of January 1, 1938, at 15,500,000,000 barrels. These are the largest reserves in history. The Southwest, which scarcely figured in the 1891 survey, is estimated to possess nearly 10 billion barrels of crude, or better than 60 percent of the nation's total visible supply."

Commenting on the economic value of the petroleum industry to the Southwest, Boyd declared it had brought into this territory $8,000,000,000 in new money; accelerated the growth of population; and created business and jobs which account for one-fourth of the total income of the region.

Natural Gas Growth

The Southwest is the most important natural gas area in the world it was stated by John S. Ivy, vice president, Union Producing Company, Houston. He pointed out that in 1936, Mississippi, Louisiana, Arkansas, Texas, Oklahoma, Kansas and New Mexico, produced 67 percent of the nation's total, as compared to 19 percent in 1906 and 35 percent in 1920. Meanwhile, the nation's output of natural gas had risen from less than 400,000,000,000 cubic feet annually to about 2,200,000,000,000 cubic feet.

"A recent estimate of the natural gas reserve of the United States indicates 62 trillion cubic feet to be presently in sight, and, of this amount, about 47 trillion cubic feet, or about 76 percent, are located in the southwestern states. Upon the basis of the 1936 rate of withdrawal, a life of 28½ years is indicated for the United States, and about 33 years for the Southwest, that is, without taking into consideration the future discovery of additional reserves that is occurring every day; nor does it take into account the waste of gas that is being allowed to occur.

A. W. Breeland, supervisor of safety for Lone Star Gas System, Dallas,

spoke on "Individual Training in Accident Prevention." He pointed to employee-job training as the most important factor in successful accident prevention, and stressed the function of the foreman in this work. As evidence of the value of individual training he told of the 10 percent reduction in accidents in 1937 in his company, while all industrial accidents were increasing 6 percent.

Breeland listed four steps that should be followed in the training of an employee. These were: (1) Tell him what to do; (2) Show him how to do it; (3) Have him do the job or perform the operation under observation of the foreman or a skilled employee designated to train him; and (4) Test him from time to time to make sure that he understands fully every step in the performance of his particular job.

In conclusion, Breeland asserted, "If an organization has the right kind of supervisors; if the same care is exercised in the selection of workmen as is exercised in the selection of materials and equipment; if a system of training is inaugurated that will insure each and every individual being thoroughly familiar with the inherent hazards in connection with his particular job and how to apply safeguards and protective devices to minimize these hazards, then the job will be done correctly and when the job has been done correctly, it will have been done safely."

Vocational Training Progresses

In tracing the progress of oil industry vocational training in Texas, J. R. D. Eddy, director of industrial education, State Department of Education, Austin, said that when the basic courses were first introduced, there was a widespread demand for them. The major portion of the needs for this type of course has been filled, although there will always be groups of new men who will desire these basic courses, but the demand will be limited.

W. S. (BUCK) MORRIS
Chairman Southwest A. P. I.

"The general courses, with the exception of the Care and Operation of Internal Combustion Engines, have not been so popular as might have been expected. The demand for them, with the exception noted above, apparently will remain sporadic and limited.

"There has been a growing demand for special courses. A large part of this demand is due to the spread of the training program into the refining division.

"The increase in enrollment for 1937-38 can be attributed to the extension of the work to include refinery employees. The number of production employees enrolled is probably no greater than in 1936-37. If the interest of production division men is to be retained, new courses with direct application to their usual work must be organized."

East Texas Pressure

The magnitude of possible losses resulting from continued water production in the East Texas are so great, declared Stuart E. Buckley, Humble Oil & Refining Company, that whatever remedial measures may be undertaken should be inaugurated before damage to the reservoir has progressed to the point at which it will be irreparable. He stated that pressure in the field depended not only upon the rate of withdrawal at any particular time but also upon the integrated effect of the entire production history, and outlined certain approximations concerning the pressure decline which may be deduced from a mathematical analysis of the water drive, which is now generally recognized as the principal reservoir energy force.

In emphasizing that water production should be controlled as well as the oil output, Buckley asserted that every barrel of water removed from the reservoir must also be replaced by additional water influx from the Woodbine sand to the west. "The increased rate of water influx can be obtained only at lower reservoir pressure; therefore the production of water results in additional pressure reduction.

"The rate of water production has increased since June, 1935, in a regular semi-logarithmic manner with time. Should the future rate of increase follow the same trend, then the entire benefits expected to be obtained through restricted rates of oil prodution are in danger of being obliterated during the next two years." Every barrel of water produced, it was said, would exact a sizeable economic toll, neglecting entirely the additional costs which would be entailed to dispose of this water.

"The ultimate recovery from the East Texas field has been variously estimated at between three and four billion barrels. With free gas extensively liberated in the reservoir in 1940 at a total production of only 1½ billion barrels, a loss of 25 percent of the remaining ultimate production would total between 350 million and 625 million barrels, directly attributable to the rate of water production, a quantity of oil greater than the combined total production of the Spindletop, Humble and Powell fields."

Conservation in New Mexico

From the time of the first production in New Mexico, to and including the present day, there has been no litigation whatever—not even a case filed in any court anywhere in the state—challenging proration, or any order of the conservation commission. This is a noteworthy and amazing thing, and is one of the reasons other states look upon New Mexico's oil and gas conservation law as a model.

Hiram M. Dow, lieutenant-governor, State of New Mexico, described the various steps taken in drafting New

E. P. HUBBARD
Gulf Coast A. P. I. Vice Chairman

A. G. LEVY
Chairman Advisory Committee
Southwest A. P. I.

Mexico's oil and gas laws. These began back in 1909, with the discovery of the first oil, and have progressed step by step with other discoveries.

However, it was in 1935, that New Mexico pioneered by enacting a comprehensive oil and gas conservation law. This act provides for a commission, which is authorized to allocate the total allowable production of crude oil in the state to the various fields, and also to prorate the production of each field to the various units within that field. It provides that no more wells shall be drilled than are reasonably necessary. The establishment of proration units is provided for, and the pooling of properties of parts of units.

Rules of the commission provide that a well cannot be drilled without a permit and limit the spacing of wells. It is required that operators outline in detail the casing program to be used. Particular attention also is paid to utilization of gas in the reservoir as a lifting agency.

Value of Drilling Time

Drilling time records have many benefits, and are being used successfully in the Goldsmith field of West Texas. Drilling time is the time required to drill a certain interval, usually one foot. The presence of porous zone and their thickness may be determined on rotary wells by this method, it was asserted by Max David, Landreth Production Company, Midland, Texas, as "porous dolomitic limestone drills faster than impervious dolomitic limestone."

There is a close relationship between drilling time and well potential in the field. The estimation of relative property values is made easier and more accurate by drilling time.

Casing points, total depths, method of acidization, and the placing of nitro shots, also may be determined by drilling time. It also furnishes valuable information for remedial work, such as plug back depths, selection of packer seats, liner positions, and pipe perforations.

The drilling time record should be made an integral part of the information procured on rotary wells in those areas where it is applicable. It furnishes valuable information to the engineer and geologist when accurately obtained, and the cost of keeping these records is practically nil, David concluded.

Permian Basin Problems

Drilling and production problems are many and peculiar in the Permian Basin area. In general, stated W. T. Doherty, Humble Oil & Refining Company, Midland, Texas, "rotary rig maintenance expense for such items as pump parts, chain, wire line, hose, brake lining, and lubricants are higher as compared to areas where formations are softer," although depths are relatively shallow.

Footage drilled per round trip is less in the Permian Basin, but it is interesting that total footage per line is greater.

In most parts of the basin the water supply is sufficient to permit use of steam rigs. However, limited water in some regions have made the Diesel or gas-gasoline rigs popular. Boiler main-

[*Continued on page 174*]

Western Metal Congress

Program includes papers particularly of interest to metallurgists in oil industry . . . One day's session given over to oil industry's problems.

A FIVE-DAY program featuring the delivery of papers on various petroleum and allied subjects closed at Los Angeles March 25, the Western Metal Congress, American Welding Society, American Society of Mechanical Engineers, and Pacific Coast Gas Association having participated in the technical sessions and scientific displays.

Featuring more than 100 speakers who delivered papers at 35 sessions, the joint program daily attracted several hundred members and guests from all parts of the country.

An outstanding part of the program was the display of the Western Metal exposition in the Pan-Pacific Auditorium, where more than 175 firms displayed their products.

Among the papers presented that applied to the petroleum industry were: "Metals Used in Petroleum Production," by Harry W. McQuaid, Republic Steel Corporation; "Metals Used in Pipe Line and Pipe Line Station Construction," by L. F. Scherer, Texas Pipe Line Company; "Theory and Practice in Pipe Protection," by Dr. Gordon N. Scott, Los Angeles; "Valves for the Petroleum Industry," by George Scherer, Merco Nordstrom Valve Company; "General Application of Metals in Refining," by R. L. Wilson, Climax Molybdenum Company; "Typical Failures of Still Tubes in Refinery Service," by E. C. Wright, National Tube Company; "Alloy Steels for Tubular Oil Heaters," by R. L. Wilson, Climax Molybdenum Company.

In addition to papers applying purely to production and refining of oil, several interesting papers on metallurgy were presented. A number of the papers described metals used in drilling and production equipment.

Feature of the Petroleum session Wednesday was a paper by Fritz Karge, Union Oil Company of California, on "Design of Transmission Systems for Heavy Oil." The author stated that to move high-viscosity oil from the new Santa Maria field, gas-engine-driven pump and direct-fired heaters have been installed at the pumping stations instead of the customary steam-driven pump and exhaust-steam heaters. Conditions that have to be met, reasons for choosing the equipment, and arrangement and operating technique of the stations were outlined.

"Fundamentals of Design of Cracking Furnaces," an interesting paper by J. H. Rickerman, W. E. Lobo and A. L. Baker, M. W. Kellogg Company, was well received. The authors stated that designing cracking furnaces requires unusual engineering attention because of the numerous variables involved. The procedure from various standpoints, emphasizing the importance of proper combination of heating surface, well designed burners, and correct handling of furnace draft in order to obtain good heat distribution, was discussed. Increased use of high temperature and pressure and the trend toward higher heating rates necessitates close checking of construction materials, the authors stressed.

At the session on fuels held March 24, F. G. Philo, Southern California Edison Company, read a paper on "Technique of Burning Fuel Oil and Natural Gas." The use of this type of fuel has increased in Southern California during the past few years. The author described procedure and equipment used at Long Beach steam station for burning natural gas which is transmitted more than 200 miles from Kettleman Hills. The storage and use of fuel oil secured from nearby refineries also was discussed. The paper gave interesting combustion data for both kinds of fuel oil.

"Combination Oil and Gas Burners," a paper by O. F. Campbell, Sinclair Refining Company, gave combustion data pertaining to burning of petroleum fuels in combination oil and gas burners for industrial use, and discussed principle of combustion involved in burning such fuels. The paper also gave brief descriptions of nine representative types of combustion burners, described their operation, and discussed their advantages and faults.

C. J. Coberly, Kobe, Inc., presented a paper on "Problems in Modern Deep-Well Pumping." The author discussed general characteristics of liquid, vapor tension, or gas operated thermometer systems, with some comments regarding their peculiarity and operating limitations.

The meeting Monday morning was devoted entirely to a symposium on welded oil-well casing strings, with P. D. McElfish, Standard Oil Company of California, as chairman and T. C. Smith, General Petroleum Corporation, as vice chairman.

"Operators' Outline of Welded Casing Requirements," a paper by K. N. Saatjian, The Texas Company, and Walter Main, Youngstown Sheet & Tube Company, was a feature of the symposium on welded casing. It was shown that welded surface casings are not new in the oil field, and that welded water and oil strings are comparatively recent developments. The authors pointed out that remarkable strides have been made in the last decade in welding technique, welding material and equipment. It is possible that further improvements are necessary to meet more adequately the condition peculiar to one of the most difficult tasks of the oil operator, that of successfully setting a water or an oil string. Some of the important factors affecting the casing joints were discussed. Among these were tensile strength, tightness of joint, casing materials, reliability, economy, ease of repair and susceptibility to danger, fire hazard, speed of assembly, reclamation, and workmanship and finish.

The most satisfactory casing joint, from an operator's standpoint, should have the

[*Continued on page 175*]

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Well Treatment After Perforating

By BRUCE BARKIS, Lane-Wells Company

THE progress that has been made in production technique has been accomplished through a clearer understanding of the mechanical efficiency of production equipment, of actual bottom hole measurements and of the physical laws that govern the flow of oil and gas through the producing zone.

Discussions with field and engineering production personnel indicate that no comprehensive study has been made of the conditions adverse to the free passage of oil through the area adjacent to the perforated casing and through the openings themselves. This applies to new zones that have been cased off and which are to be tested for production as well as to zones that have been producing but show the need for remedial work to stimulate or revive production.

THE author states that while well-cleaning methods now used result favorably, but little is known regarding the material removed from the well during the cleaning operation, nor regarding the free passage of oil through the area adjacent to pipe perforations at the producing zone. Well conditions prior to perforating and present cleaning methods are discussed briefly; detailed records obtained during cleaning operations, not now available, together with conditions before and after perforating, will permit a better evaluation of cleaning operations.

This paper was presented before the Spring Meeting of the Southwestern District of the American Petroleum Institute Division of Production on March 25, 1938. **The statements and opinions expressed are those of the author, and should not be construed as an official action or opinion of the Institute or this magazine.**

Well Conditions Influencing Perforating

Well records covering the number of casing strings, their kind, weight and depth, whether blank or perforated, and the condition of the casing, should be readily available, and will determine the perforating specifications.

The only factor influencing perforating that usually can be controlled by the field personnel is the kind and amount of fluid in the hole. The opinion expressed by H. E. Winter[1] that "the fluid should be 500 to 1500 feet lower than the expected fluid level in order to let the incoming fluid clean the smaller perforations" has been generally followed in field practice.

A further study of the conditions within the zone, correlated with the treatment that this study indicates should be used subsequent to perforating, will give more definite information on the kind and amount of fluid that should be left in the well.

In a well where casing has been cemented through a productive zone (see Figure 1) and is to be perforated, the natural zone characteristics including the type of oil, amount of gas, formation pressure, permeability, porosity, grain size, shear and water content may be known.

The sealing action of mud fluid and its possible penetration into the productive zone along with the drilling water which has filtered through the mud sheath has been studied extensively and the results of this study have been published.

Recent investigation of the effect of water filtration through the mud cake and into the pore spaces of the sand and the consequent reduction in permeability of these sands is covered in an article by Larsen[2] in which the capillary behavior of water-oil mixtures is discussed.

In placing the cement behind the casing, the scouring action has been recognized although we do not know the thickness of the mud film left on the sand face. The effect of the natural formation temperature and the heat of crystallization of the cement on this film and on the mud fluid in the pore space of the sand is to cause a further obstruction; moreover, it has been pointed out by C. P. Bowie[3] that "where wells have been drilled through oil-producing formations of low differential pressure, a sheath of mud cake has been formed between the casing and the surface of the formation, which after a time becomes as hard and as impervious to the passage of oil as the cap rock that holds the oil and gas in place in the structure. Actually, the clay in the drilling fluid, which later becomes a mud cake behind the casing, was a pulverized part of that cap rock or some similar material."

Remedial measures taken to stimulate or bring back production in an old producing well will generally have to overcome even more adverse subsurface conditions. The natural zone characteristics, as outlined above, will have been reflected in the production history of the well. The method of originally completing the well will indicate whether mud and other contaminating material has been completely removed from the slot openings,

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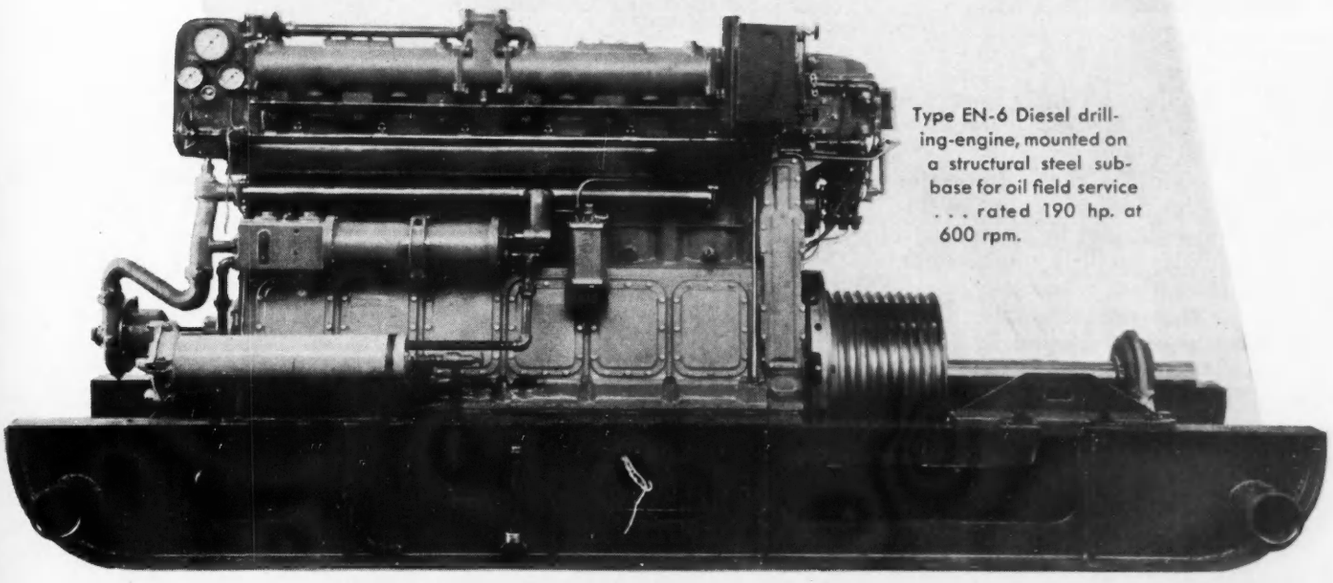

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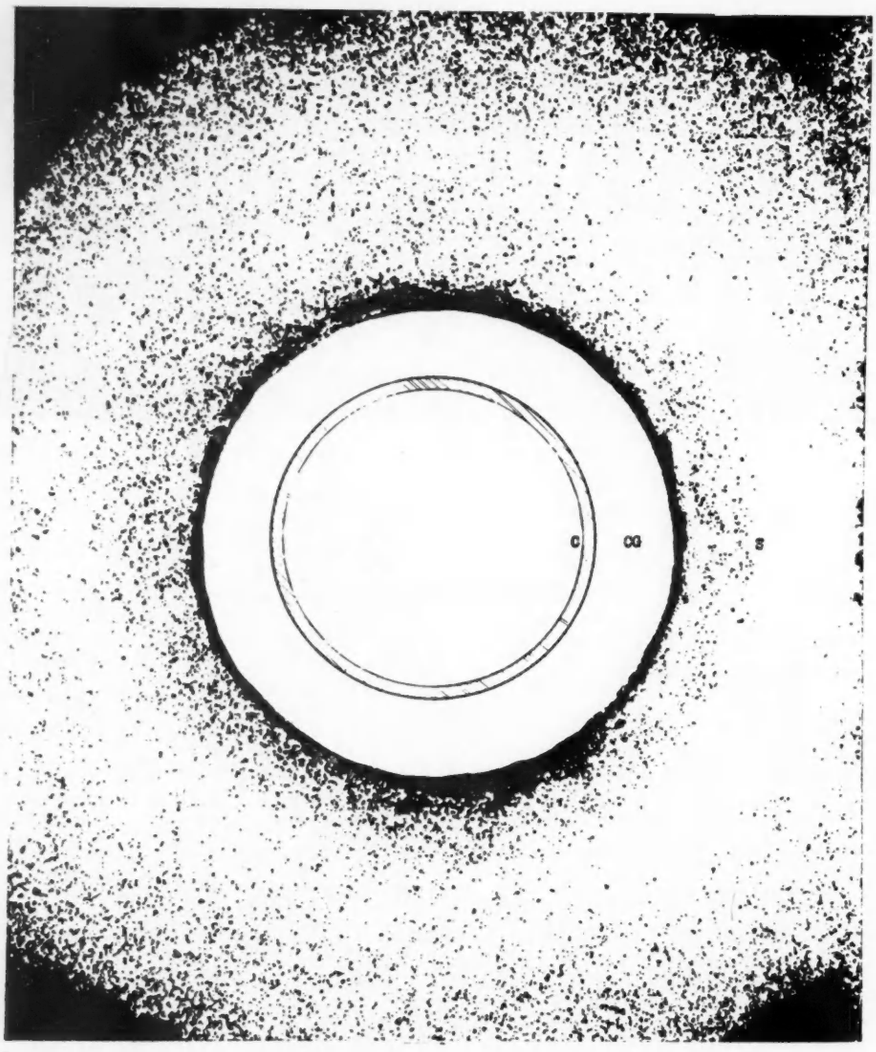

FIGURE 1

Cross sectional plan of cased-off productive sand. C—casing, CG—cement grout, M—mud sheath, S—oil sand with infiltrated water in pore space.

and extending laterally into the formation where the natural sand conditions obtain.

The condition of the formation beyond the face may be in the condition indicated in Figure 2. It will probably be in a more aggravated form than when the formation has been encased and cemented. In a paper delivered by H. E. Winter,[4] the theory was expressed that "as the well is produced, the oil moving toward the hole carries with it a small amount of silt or colloidal material which may tend to accumulate in the pores of the sand and clog the sand. This clogging action may also be aggravated by the waxing or sludging effect of certain types of oils. In effect, this may form a ring of impervious material around the well. This action might take place several feet back from the perforations, so that no amount of perforation washing will do any good. If certain salt waters are being produced with the oil, the condition may be further aggravated by chemical action or deposition of salts. Just how this trouble may be overcome is not apparent as yet, although some washback action with the proper fluids or chemicals may open up the passage for the oil."

The ability of the formation to retain its original wall depends principally on shear and the pressure drop at the sand face. Even though the original hole diameter is retained, restriction to flow caused by cavings, sand bridging and contaminating material mentioned above may result with a marked decline in production. Where the original hole diameter is not retained, the restriction to flow is even more pronounced.

Penetration

Extensive field experience and laboratory tests have developed the factors such as gun design, bullet design, and the kind and amount of powder that provide satisfactory penetration.

Uniform penetrative energy is insured by accurate measurement of powder, maintenance of barrel tolerances and precautions to prevent wetting of the powder charge.

Surface penetration tests have conclusively developed the comparative effect of variations of these factors and while several penetration tests made in wells have shown that double strings of casing cemented together can be perforated, no series of tests have been made under simulated well conditions to determine the penetration of the bullet into various formations.

Drainage Opening

If there were no further restriction to flow of oil through perforations than the pressure drop caused in the perforation itself, it would be a simple matter to calculate the number of perforations required. The area of various average openings in relation to pipe area and wall face is shown in Figure 3, and the small percentage of drainage opening in relation to pipe area is evident.

Considering the many adverse conditions which may obtain behind the casing, on the face of the formation, in the formation itself and even in the slot openings (all

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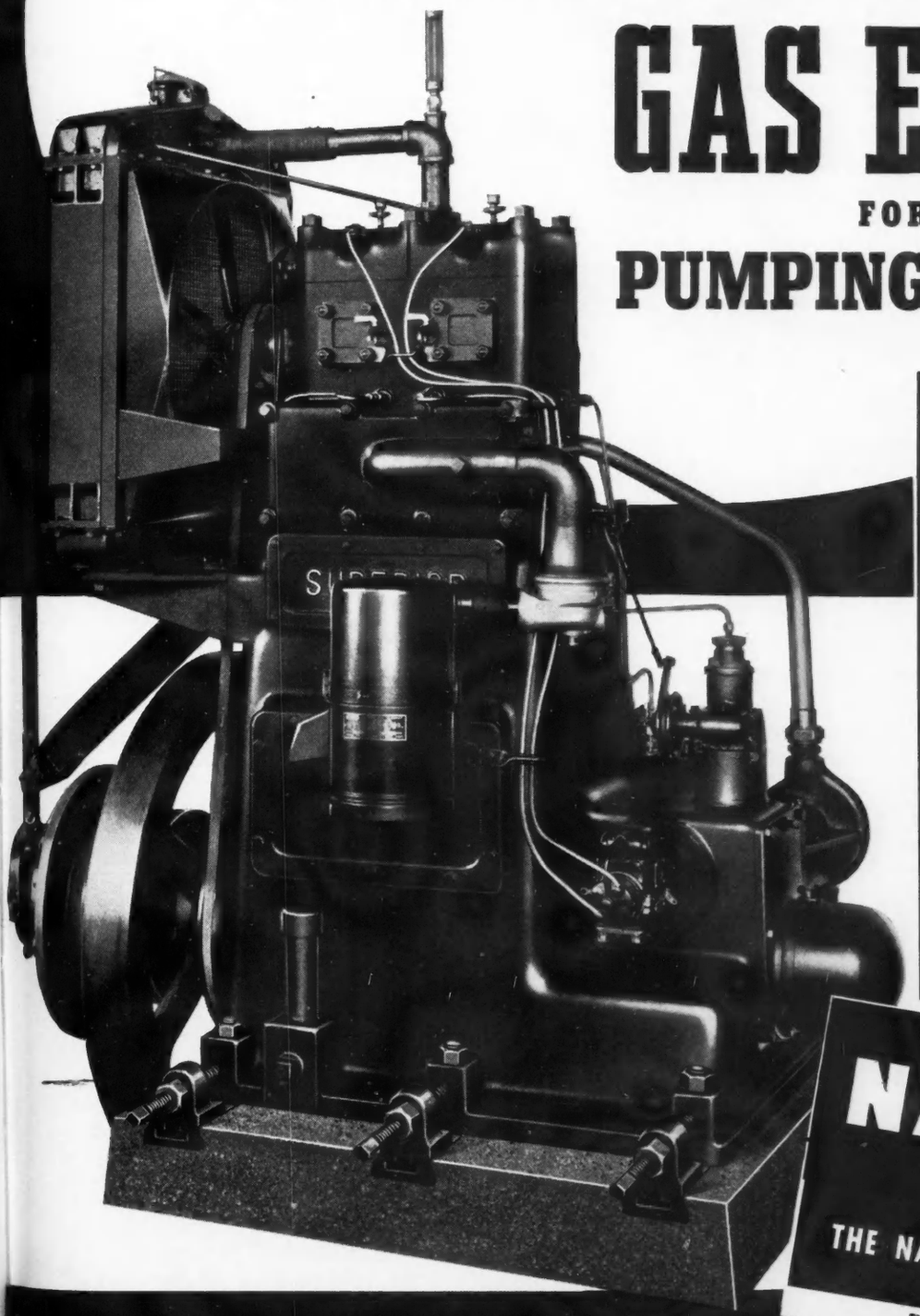

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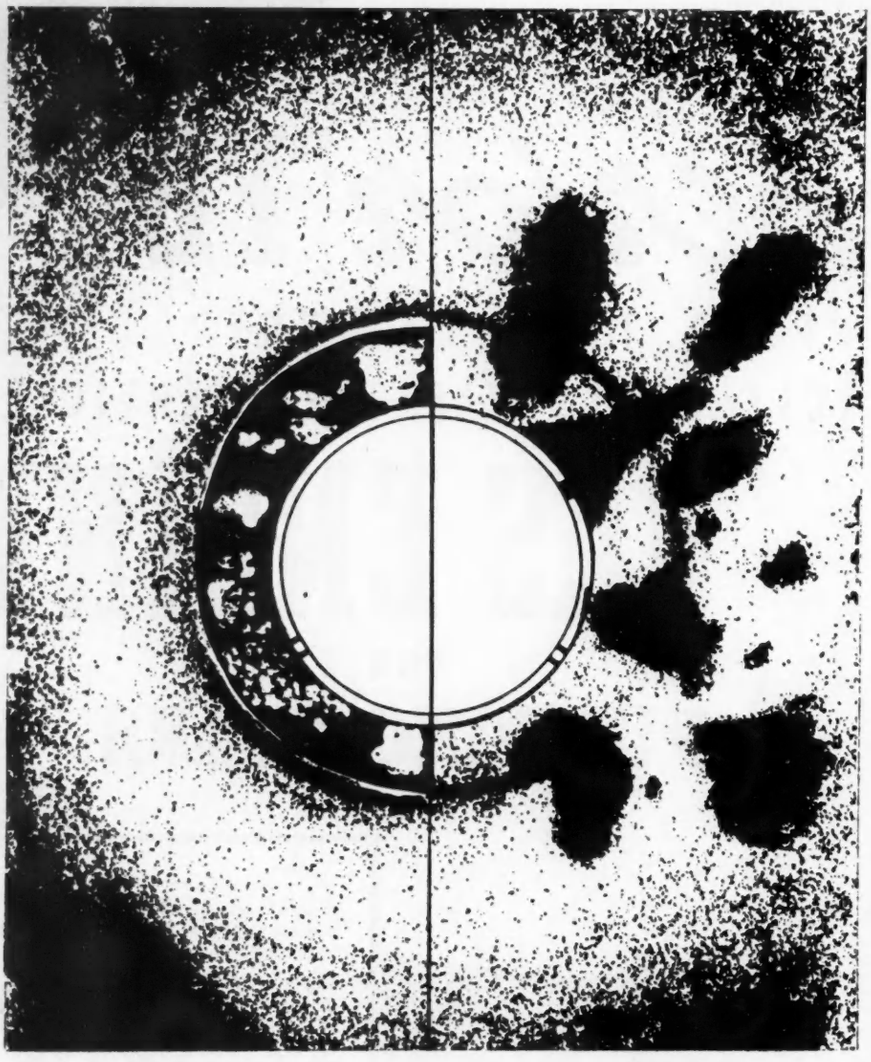

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FIGURE 2
Cross sectional plan through sand.

of which have been previously discussed) it has been common practice to use more openings than might be theoretically required. The advantages of providing ample drainage openings are to decrease the restriction to flow, prolong the interval between treatment, to simplify the treatment method and provide a better opportunity to remove the material obstructing free entry of the oil.

Treatment Methods

Well treatment methods are primarily of the mechanical, hydraulic and chemical type. The mechanical cleaners include perforation scrapers and bailers for removal of material from the bottom of the oil string. The hydraulic methods depend on pressure differential opposite the zone to be cleaned while the chemical methods involve the breaking down or dissolving of the interfering material.

Hydraulic Cleaners

When our customary completion practices are analyzed, including washing, swabbing, circulation with oil, so-called pressure-drilling and sub-circulation methods, it is evident that the harmful effect of mud fluid and water in sealing and restricting the free passage of oil through the sand pores, annular space and the openings themselves, is of principal concern.

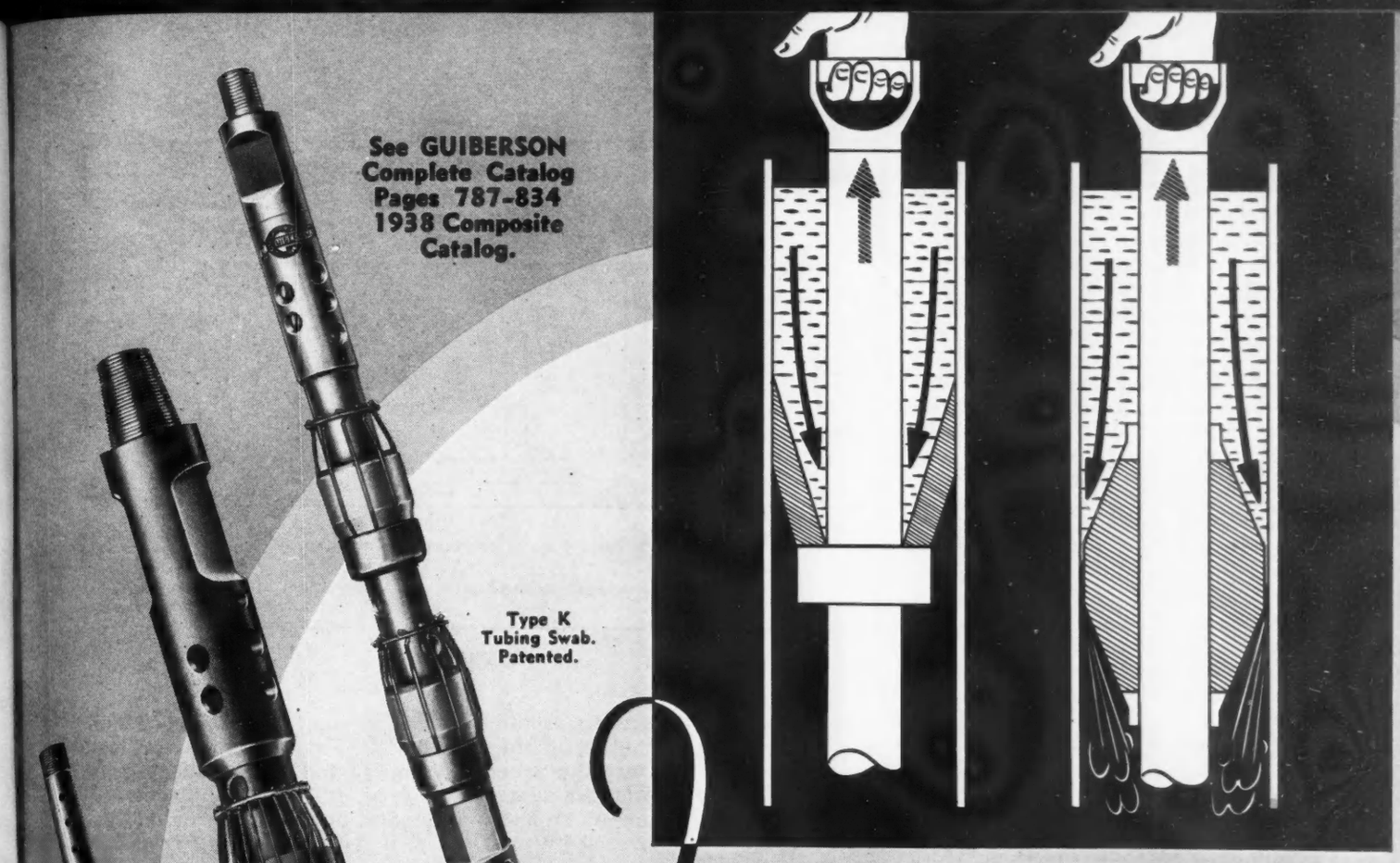
Whether or not these methods are adequate, the advisability of removing all of the mud fluid and water can not be questioned and the hydraulic cleaning methods have been the ones principally used for this purpose. These methods depend on differential pressure to utilize formation pressure or pump pressure to open the perforation. In the suction bailer and vacuum washer, a decreased pressure (in some instances approaching atmospheric pressure) is confined to a restricted pipe area through the use of packers. This is accompanied by a surging action of the fluid resulting from the equalization of pressures in which the total pressure due to the hydrostatic head is exerted against the perforations just above the packer. Washers of the pressure type produce increased pressures opposite the perforations through the use of pumps or through tubing travel to overcome restrictions in the perforations, the annular space and the pore space in the sand.

While the production engineer generally advises when a well is to be cleaned, the selection of the method used often rests with the field personnal and a survey has shown that records pertaining to the kind and amount of material removed and to the intimate details of the clean-out operation are very incomplete.

The effective bottom hole pressures obtained by the various types of bailers, swabs and washers are most generally unknown; and since it is necessary to evaluate the efficiency of the cleaning method on the differential pressure it obtains at the slot opening, the comparison of methods has been based on incomplete data.

Chemical Methods

These treatments of wells, where production is obtained from sand



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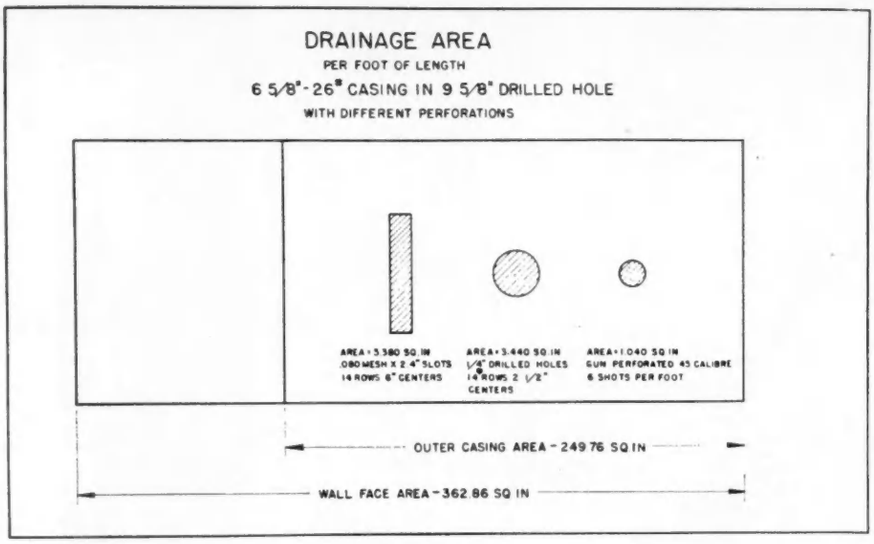
zones, have been for the purpose of breaking down mud sheaths and the lowering of viscosity of mud or sludge material from the pore spaces of the sand and for the dissolving of deposited salts. Morris[5] has pointed out that "it is axiomatic that, before well productivity can be increased by chemical treatment, there must be production obstructed from the hole by a substance or substances which can be effectively broken down by chemical action. To secure results it is essential that an accurate diagnosis be made as to the nature of the material responsible for the subnormal production, so that the proper chemical may be applied in treating the well. Detailed review of chemical clean-out work indicates that unsatisfactory results were obtained at a number of wells because either the chemicals were unsuited for the job or treatment of the well was not justified."

In addition it is entirely possible that the percentage of successful treatments could be increased providing the proper preliminary and follow-up hydraulic methods were applied.

In plug-back operations, or in new well completion where production is to be obtained from limestone, the use of acid through perforations is common practice. The fracturing of the lime formation adjacent to the casing from perforating aids in the more efficient placement of acid and later in increasing the drainage face. Here again the use of the proper hydraulic cleaning method in connection with acidization may increase the results obtained.

Since the engineer controls the kind of fluid in the casing at the time of perforating, the use of the proper chemical opposite the zone to be perforated and at the same time utilizing the pressures and fluid surging effect created by the powder charge may assist in breaking down surface tension dams and in the later removal of foreign materials.


DRAINAGE AREA
PER FOOT OF LENGTH
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WITH DIFFERENT PERFORATIONS
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.080 MESH X 2 4" SLOTS
14 ROWS 6" CENTERS
AREA = 3.440 SQ IN
1/4" DRILLED HOLES
14 ROWS 2 1/2" CENTERS
AREA = 1.040 SQ IN
GUN PERFORATED 45 CALIBRE
6 SHOTS PER FOOT
OUTER CASING AREA - 249 76 SQ IN
WALL FACE AREA - 362 86 SQ IN

FIGURE 3

Other Methods

The washing of the productive zone with hot salt water has resulted favorably in some instances and it is reported by F. R. Cozzens[6] "Cleaning oil sands with hot air is a practice that is giving good results in the shallow sand fields of Southern Ohio. . . . A greater volume of production, better grade of oil, and prolonged life of the well, are some of the beneficial results of hot air sand cleaning. The method is easily adapted to any type of sand, and can be utilized at any depth, provided insulation is applied to conserve heat."

Conclusion

The conservation of our natural resources through the production of oil that might never have been otherwise recovered is important. Figure 4 is an example of a well recently treated in the Huntington Beach field, California. Production prior to treatment had declined to three barrels per day and abandonment was considered. The graph indicates the treatment given, with a resulting increase of production to about 28 barrels per day. It is reasonable to conclude that the treatment in this well was amply justified and there are undoubtedly many wells in which an engineering analysis will show that proper treatment method after perforating will remove obstruction to the free entrance of oil and result in increased recovery.

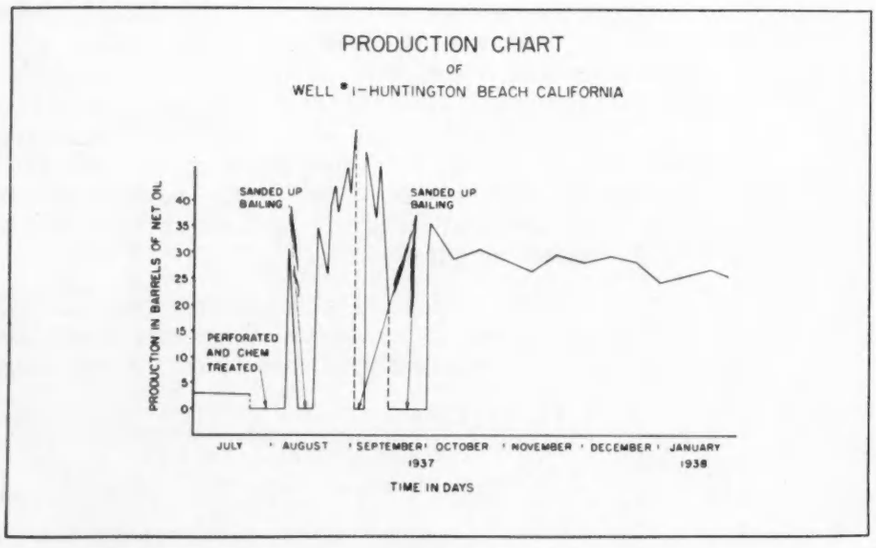


FIGURE 4

[1] "Reconditioning Procedure with Portable Equipment" read before the A.P.I. Pacific Coast District Meeting at Los Angeles, Calif., on April 13, 1937. Reproduced in full in "Drilling and Production Practice—1937."

[2] Loss of Water to Oil Bearing Formations as a Basic Cause of Low Production. Drilling Mud April, 1937.

[3] U. S. Bureau of Mines Report of Investigations No. 3384 "Hardening of Mud Sheaths in Contact with Oil."

[4] Op. cit.

[5] "Chemical Clean-Out of Oil Wells in California," by M. W. Morris, read before the A.P.I. Pacific Coast District meeting at Los Angeles, Calif., on April 13, 1937. Reproduced in full in "Drilling and Production Practice—1937."

[6] "Cleaning Oil Sands with Hot Air"—Petroleum Engineer, June, 1937.

Ark-La-Tex

Today and Tomorrow

Great changes wrought by recent strikes indicate bulk of future production to be from Lower Cretaceous or deeper strata

By HARRY D. EASTON, JR.
Petroleum Engineer & Geologist
Shreveport, Louisiana

WHEREAS older and shallower oil fields of the Ark-La-Tex, or Tri-State, district found their production largely in Upper Cretaceous beds, the bulk of present oil production, except for the East Texas field, is coming from Lower Cretaceous beds of Glen Rose age, and indications are that present development is opening older and deeper reservoirs whose production will eclipse anything heretofore known in this area.

In THE OIL WEEKLY of March 25, 1935, Page 37, there appeared a portion of H. D. Easton's Index Map, but on that map we do not see Lisbon nor Rodessa, whose combined daily production of approximately 52,000 barrels represents 72 percent of the entire production from North Louisiana; we see the Cotton Valley field spotted on the map but not the Cotton Valley of today with its deep Travis Peak oil production; we do not see the Cass County, Texas, portion of the Rodessa field nor the Jefferson field of Marion County; we do not see the Schuler field of Arkansas, nor any of the other new areas opened up with but one or two wells completed to date. All these fields find their big production in Glen Rose, or older beds. There are other areas not mentioned because their development has not progressed to a stage to put them in the ranks of the major oil fields, and these areas also find their production in newly discovered but geologically older horizons.

Rodessa was the first major Glen Rose pool and with drilling depths around 6000 feet marked the advent of deep production and even deeper prospecting in what has been dubbed the "Ark-La-Tex" area. Rodessa has already produced over 40,000,000 barrels from the Glen Rose.

Next-door to Shreveport, the old Sligo gas field found oil in the oolitic Pettit sand at the very base of the Glen Rose, and the Lisbon oil field, discovered on Christmas, 1936, is now producing its third million barrels of oil from the Pettit with nearly 200 producing oil wells, no dry holes and no limits for the field have been reached in any direction. Lisbon has been the biggest Tri-State discovery since Rodessa. Most of North Louisiana will require 6000-foot drilling to prospect all the Glen Rose, any portion of which may be found productive, and consequently a wildcat not drilled to the top of the Travis Peak is no test at all.

With the Lower Cretaceous Trinity (Paluxy, Glen Rose and Travis Peak) we have become increasingly interested as its economic importance as an oil producer was established. Top member of the Trinity, Paluxy, is not found in the North Louisiana-Southwest Arkansas area, but at Talco and Sulphur Bluff over 12,000,000 barrels of oil has been produced from the Paluxy. The Paluxy, like the Glen Rose and Travis Peak, was of little or no concern prior to Talco's discovery but additional Paluxy fields can be expected in western Ark-La-Tex.

Nearly 13 years ago (July 3, 1925) THE OIL WEEKLY carried an article by H. D. Easton on "Oil and Gas Possibilities in the Trinity," and it is interesting to reread that old article and compare its predictions with Ark-La-Tex developments in the past three or so years. Just a few quotes for the benefit of those whose files are not complete: "It is to be expected that the lighter constituents (of Trinity oil) might work up to higher levels in the Trinity formation thus giving a rich gas pay near the top of the Trinity and light oil deeper in the formation." Compare that with results at Rodessa which was a big gas field in the topmost Glen Rose pay (Hill sand) beneath the anhydrite and which found its enormous oil reserves deeper. "Wells near Ashdown, Little River County, Arkansas, about 25 miles south of the Trinity outcrop, show much more than 2000 feet of thickness for the Trinity formation and plenty of sand bodies and capping materials, lacking only closed structure to make an oil field." The presence of this great thickness of Trinity is attested by a number of deep test wells drilled recently and about which more later. "A productive structure in the Upper Cretaceous is most likely to overlie a still better fold in the Lower Cretaceous where light oil can be had from the Trinity formation." Outstanding development substantiating that statement is seen at Cotton Valley, productive for many years in Upper Cretaceous beds and now a field of major proportions in the Travis Peak and "Black Marine" (lower phase of Travis Peak). Surprisingly enough,

despite obvious advantages of deeper drilling in these old fields, many of our deepest wildcats have been drilled on questionable structures while proven structures under old fields remain untested in deeper zones. Eventually most of the fields shown on the Sabine Uplift area of insert map in this issue of THE OIL WEEKLY will be "rediscovered" as Trinity, or older, fields.

As previously stated, the Glen Rose, with its production at Rodessa and with its Pettit oil at Lisbon, now supplies the bulk of Ark-La-Tex production (excluding, of course, the East Texas oil field which produces from the Woodbine sand of Upper Cretaceous age). A number of new Glen Rose fields is to be expected and many a million barrels of oil will be produced therefrom: however, potentialities of the Travis Peak are even greater. Whereas original estimates placed the total thickness of the Trinity group as "much more than 2000 feet" it now develops that the thickness of the Travis Peak alone is that great, over much of this tri-state area.

Numerous unconformities, discussed in more or less detail in previous articles, still tend to make estimates of drilling depths rather hazardous. A major unconformity between the Fredericksburg and Paluxy shows its effects in the almost total absence of Paluxy in North Louisiana. Another such unconformity is found between the Glen Rose and Travis Peak with varying thicknesses of Glen Rose and even varying thicknesses of individual phases of the Glen Rose (e.g. anhydrite zone may be 750 feet thick or only a few inches of anhydrite found) noted in drilling. In THE OIL WEEKLY, March 25, 1935, H. D. Easton pointed out difficulties of well correlation in North Louisiana and aptly stated "North Louisiana presents the geologist with a cockeyed cross-word puzzle." In addition to eight major regional structural conditions pointed out by Easton we find ample reasons for variations in the Glen Rose itself because of conditions under which the Glen Rose was deposited.

A sudden change from marine deposits to clastic red shales is so evident to the paleontologist that it fairly snaps at him through his microscope, thus marking the top of the Travis Peak. Near the top of the Travis Peak is often, but not always, found a zone of about 10 feet of lime. In Southwest Arkansas this lime streak is missing, hence the microgeologist uses only the change from marine to clastic as his "marker." An extensive thickness of Travis Peak has been found in numerous deep (8000 to 9000 foot) tests and the Travis Peak has, in turn, been subdivided into two zones: the upper is made up largely of shales and limes at its top and sands in its bottom portion and is referred to as "Travis Peak"; the lower Travis Peak is variously known as "Lower Marine," "Black Marine" or "Lower Travis Peak" and the transition from Travis Peak" sands to "Lower Marine" black brittle shale is even more readily apparent than that from Glen Rose to Travis Peak.

The "Travis Peak" alone has been found to have (at Cotton Valley and Sugar Creek) a thickness of about 2000 feet, which means drilling depths of around 7000 to 8000 feet to prospect clear through the "Travis Peak." Pioneer deep well at Sugar Creek, Triangle Drilling Company et al, Addie Durrett 2, Section 31-20n-5w, went to 8616 feet and encountered so many sands and limes in the Travis Peak which gave good shows of oil and gas that it is evident there will probably be found producing zones in this thickness almost too numerous to classify. Naturally no one of these zones necessarily would be found over any widespread area covering separate fields but the presence of these sands and limes throughout a 2000-foot zone indicates the necessity for careful and complete coring of any breaks encountered. Although favorable sands were found in the Lower Marine section of Durrett 2, mechanical difficulties necessitated abandoning the lower horizons and the well was completed as a large gasser farther up (around 5400 feet). Difficulties in drilling this well, which necessarily required extensive and expensive coring, show that such a test should set conductor pipe of large size, a surface string of 13⅜ well through the Wilcox formation; 9⅝ at least through the Glen Rose, thus giving only two to four thousand feet of open hole in prospecting the "Travis Peak" and Lower Marine and enabling setting of 7-inch production string on a lower pay zone.

Picture at Cotton Valley

The Cotton Valley field gives perhaps the most complete information of the Travis Peak in this area. This field, about 35 miles northeast of Shreveport, in Webster Parish, Louisiana, had its discovery in 1922 with a 25,000,000 foot gas well in the Blossom horizon, and oil was subsequently found there also. Early history of the field is ably discussed by J. S. Ross in U.S.B.M. T.P. No. 504, "Engineering Report of Cotton Valley Field" and Ross described Cotton Valley as a "Typical example of a 'textbook' ideal structure." Without going into any details of older and shallower development, or recent deeper activities, it is interesting to look over the record of a typical deeper well.

The top of the Travis Peak (equals base of Glen Rose) is found at around 5500 feet drilling depth (elevations in the field are around 200 feet) and immediately beneath a small thickness of the red shale which characterizes the change of sediments, there has been found a 15-foot sand bed called the Holloway sand, after one of the fee owners. This particular sand is a true quartz sand, typical of Travis Peak sands as evidenced at their outcrops, and in five wells is producing a light greenish brown crude oil with an A.P.I. gravity of 52° with gas/oil ratios of 1800 more or less. This light crude is a desirable product marketing at $1.35 per barrel, which means a fair payout for a $45,000 Holloway sand well even under proration.

Following discovery of deeper production some operators planned to set 7-inch casing in the 8000-foot region and perforate opposite the Holloway sand. Because this program required continued reshooting, present schedules call for setting 9⅝ as production string for the Holloway and protection string for future drilling to the deeper zones.

After the Holloway zone is encountered, there follows around 2100 feet of Red Beds, with the bottom 1000 feet showing a number of sand zones. Although these sands have shown resistivity and porosity in electrical logging surveys, not much saturation has been found in cores. Production may be found in these sands in other areas but they do not offer as much promise at Cotton Valley as the Holloway and Bodcau sands.

This makes the top of the lower half of the Travis Peak at a drilling depth around 7600 feet. I will not undertake to name this lower zone nor its various members because the American Association of Petroleum Geologists will shortly establish an official nomenclature schedule necessitated by recent deeper drilling in the Ark-La-Tex area. Meanwhile, for the purposes of identification, since it is a part of the Travis Peak, I will refer to the lower marine zone of the Travis Peak as "Lower Travis Peak," and to the upper as "Upper Travis Peak."

The top of the Lower Travis Peak

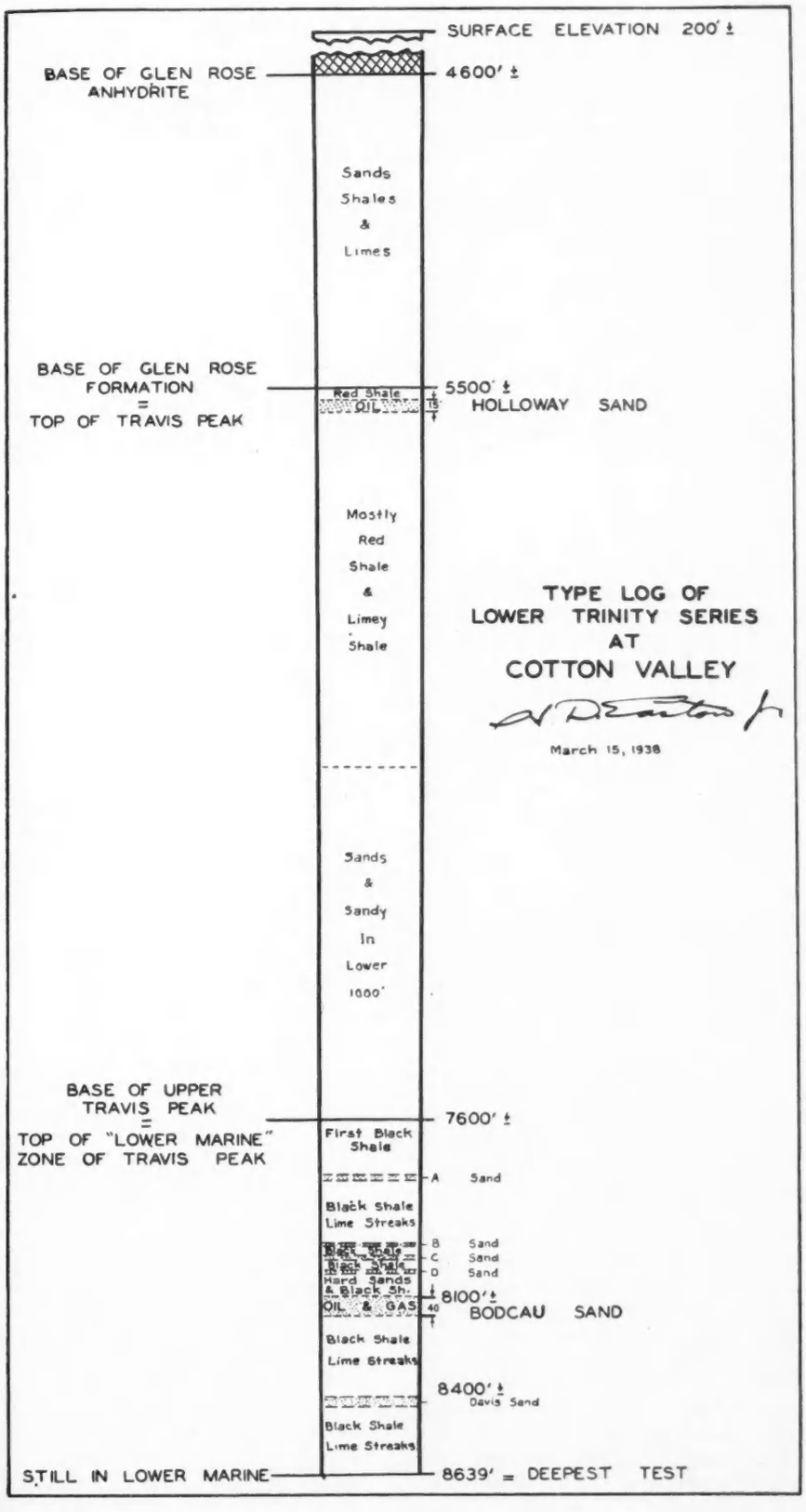
is characterized by appearance of black, or blue-black shales which appear very prominently after the sands at the bottom of the Upper Travis Peak. There is a thickness of 500 feet of these black shales to be drilled before the big deep Bodcau sand is found; "big" by comparison with the Holloway as the Bodcau is nearly three times as thick (40 feet); "deep," meaning around 8150 feet.

This black shale zone is not all shale; there is some lime and also there are several sands encountered above the Bodcau. About 150 feet below the top of the Lower Marine there is a thin, erratic "A" sand; 225 feet below "A" we find a similar "B" sand; then 50 feet to the "C" sand; then 50 feet to "D" and, finally, 75 feet to the top of the Bodcau. These sands may offer future production, but the Bodcau is too near and too productive to justify worrying with its thin upper neighbors.

Also a true quartz sand, the Bodcau is producing a white oil of around 62° A.P.I. which has been misnamed "distillate." Still, it is a casinghead product from wells with gas/oil ratios around 12,500 and it might better be called something besides crude oil, so perhaps if enough of this "distillate" production is found, the refiners could be induced to change the name of their partially refined product to avoid crossing up the newspapers. This product obviously commands a premium and even the payout of a $115,000 investment per well may be anticipated.

Production potentialities of zones between the Bodcau and Holloway sands have been mentioned; these potentialities also apply to zones deeper than the Bodcau. No well at Cotton Valley has drilled deep enough to see what comes beneath the Lower Travis Peak. Deepest well in the field is Magnolia Petroleum Company's Cox 5 which was still in black shale and sand at 8639 feet. This well was completed as a Bodcau producer, topping that sand at 8090 feet. Its bottom-hole pressure of 3970 pounds per square inch gives an idea as to operating pressures in the Bodcau horizon.

The "type log" shown for lower Trinity beds at Cotton Valley looks pretty good. It would indeed be convenient if one could draw up a nice type log which would enable an operator or wildcatter to go into some new Ark-La-Tex territory and, knowing what beds were on the surface, be able to tell approximately at what depths he might expect production in any of the numerous pay horizons available. Unfortunately we still find a cockeyed puzzle for the geologist and operator because of the numerous regional features which make any columnar section applicable only to a limited area.



Geological Features

Reviewing these features we find: The North Louisiana Uplift, comprising, (1) the Sabine Uplift, a broad domal upheaval in Northwest Louisiana approximately 80 miles across, and, (2) the Monroe Uplift of Northeast Louisiana with a major fault (the Monroe fault) running northwest-southeast to separate the

two uplifts, and an igneous intrusion of such magnitude that in most of the Monroe gas area the bit enters igneous rock immediately beneath the Nacatoch (Monroe Gas Rock). Numerous unconformities, with resultant missing sections, knock a regional section to pieces; the Midway rests unconformably on the Arkadelphia; unconformities between Tokio (Woodbine) and Washita, Washita and Fredericksburg and Fredericksburg and Trinity, with both Washita and Fredericksburg missing in places (e.g. Pine Island) can give a triple unconformity; another unconformity between Glen Rose and Travis Peak; major unconformities between Cretaceous and Jurassic, Jurassic and Triassic and Paleozoics, with Jurassic and Triassic probably almost entirely missing in this whole area, gives a triple major unconformity. Add some 11 old volcanos, about 20 interior salt domes, the Angelina-Caldwell flexure and advancing and retreating shore lines and you will find a veritable hodge-podge of subsurface factors which make long distance correlation difficult, to say the least.

Important Deep Markers

North Louisiana's deepest test is R. W. Norton's Payne 1, south of Rodessa, which went into rock salt at 11,470 feet, made 16 feet more hole and quit. Age of this salt is unknown; perhaps it is Permian and the lime section overlying it is the local equivalent of West Texas' "Big Lime." Of course salt might be found in beds of any age and here one need not be surprised to encounter rock salt at any depth. In 1931, Lion Oil Refining Company drilled its Hays A-9, a deep test in the Smackover, Arkansas, field. This well found around 700 feet of lime (topped at 5234 feet) with a few shows, then at 5965 ran into rock salt. With only one little zone of salt and sand, from 6652 to 6662, it drilled solid salt to 7255 feet and then was junked. Such a thickness of salt would have had the Payne well still briney at 13,000 feet which is no mean depth for anybody's drilling these days, and with unknown conditions beneath the salt.

Hays A-9 was located in the eastern portion of Smackover; 7 miles west, Gulf Oil Corporation drilled its Werner Saw Mill 49 in 1935. At 5730 feet Werner Saw Mill 49 found red shale with greyish white anhydrite which continued to 5860 feet where solid reddish dolomitic anhydrite was topped and continued to 5908 feet. Then followed 800 feet of lime, generally accepted as Permian, 35 feet of red sandy shale and then rock salt. This well continued through the salt and after drilling 850 feet went back into anhydrite, then after 60 feet of anhydrite went into conglomerate, hard red and purple shale and sandstone. At 7938 feet black igneous rock was encountered and at 7973 feet the well was abandoned, still in igneous rock.

These last two named wells showed that below the lowest known Travis Peak beds there was 700 feet of lime, and that this lime could be expected to be productive under favorable trapping conditions. H. L. Hunt's Gregory 15, in Section 10-17-14, found 800 feet of this lime and was abandoned in salt. In 1936 this same lime was found productive on the northeast edge of the Smackover field, in the Snowhill area, by Phillips Petroleum Company's Reynolds 1. Because geologists hesitated to call this lime Permian while its age was admittedly unknown, it was called the Smackover Lime and the upper oolitic zone became known as the Reynolds oolite, after the fee owner.

While the discovery of a new producing horizon the Snowhill field was highly significant, as an economic success it was a flop. Six producing wells have dwindled to two as production fizzled out; that and three dry holes served as an admirable damper to operators' enthusiasm. Referring to this lime as "Permian," I have pointed out four "Permian" producing areas indicated by the Snowhill discovery; stratigraphic traps formed by truncated edges or pinching out of south dipping beds southeast of the Ouachita mountains, the same for north dipping beds northwest of the Northeast Louisiana Igneous Uplift, a central basin between the two and a zone of deeper production in the Sabine Uplift area. (Oil & Gas Journal, July 2, 1936).

In the interests of scientific accuracy one could spend a lot of time arguing "Permian or non-Permian" but "pure" science has never been a very lucrative profession and the important thing is that Schuler, Buckner and Kerr-Lynn have demonstrated that this basin in Arkansas is very productive in this lime, and production is always of interest to operators.

Excluding Rodessa extensions into Miller County, the Schuler field of Union County, Arkansas, was the greatest "pump primer" for renewed interest in Arkansas. Following seismic investigations Phillips Petroleum Company drilled its Edna Morgan 1 to a barren depth of 4270 feet. This well, in Section 18-18s-17w, was deepened by Lion Oil Refining Company and resulted in the discovery well of the field with production from Travis Peak sand at 5556 feet in April, 1937. Subsequent development of the field showed a number of erratic sand lenses which were called the Morgan sands, and sometimes Morgan "A," "B," "C," etc.

The resultant drilling campaign died down in enthusiasm as production of old declined and of salt water increased in the discovery well and as all Morgan wells developed water trouble. Newer and greater interest was aroused by E. M. Jones' Marine 1, Section 17-18s-17w, which found the Morgan zone barren and continued down to discover a sand at 7544 feet, still Travis Peak, and that sand is now the principal producer of Schuler. Instead of naming this sand after the fee owner, it became known as the Jones sand. The Jones sand is the immediate objective of new wells and the future goal of the few remaining Morgan producers. With the Morgan sands going to water, Phillips and Lion deepened their Morgan 1 with an eye towards the Jones sand and deeper possibilities, with the result that the Reynolds oolite of the Smackover lime was found at 7631 feet and in October, 1937, was completed as a large gas and "distillate" producer.

The history of the Schuler field has been well covered elsewhere; let us now look at the Schuler column of Lower Trinity and older beds. Glen Rose anhydrite is missing and the absence of this anhydrite is readily understandable when one considers the present truncated attitude of Lower Cretaceous beds and the conditions under which this anhydrite was laid down, which conditions preclude the possibility of its being found in a very regular fashion as it was deposited in shallow evaporating pan basins of bygone seas. One should not undertake to correlate the Schuler Glen Rose with any distant areas, however, the name of the second producing horizon at Rodessa (Gloyd) persists and we find the "Lower Gloyd" zone, shale sand and lime here, at 3385 feet in the discovery well. Then we have the James lime at 3615 feet and as this zone was named by Arkansas Natural Gas Company's James 1, Section 14-20n-1e, Union Parish, Louisiana, which is about 35 miles southeast of Schuler and on the same terrace which is gently dipping to the south, it can provide a pretty good marker.

Top of the Travis Peak, the zone

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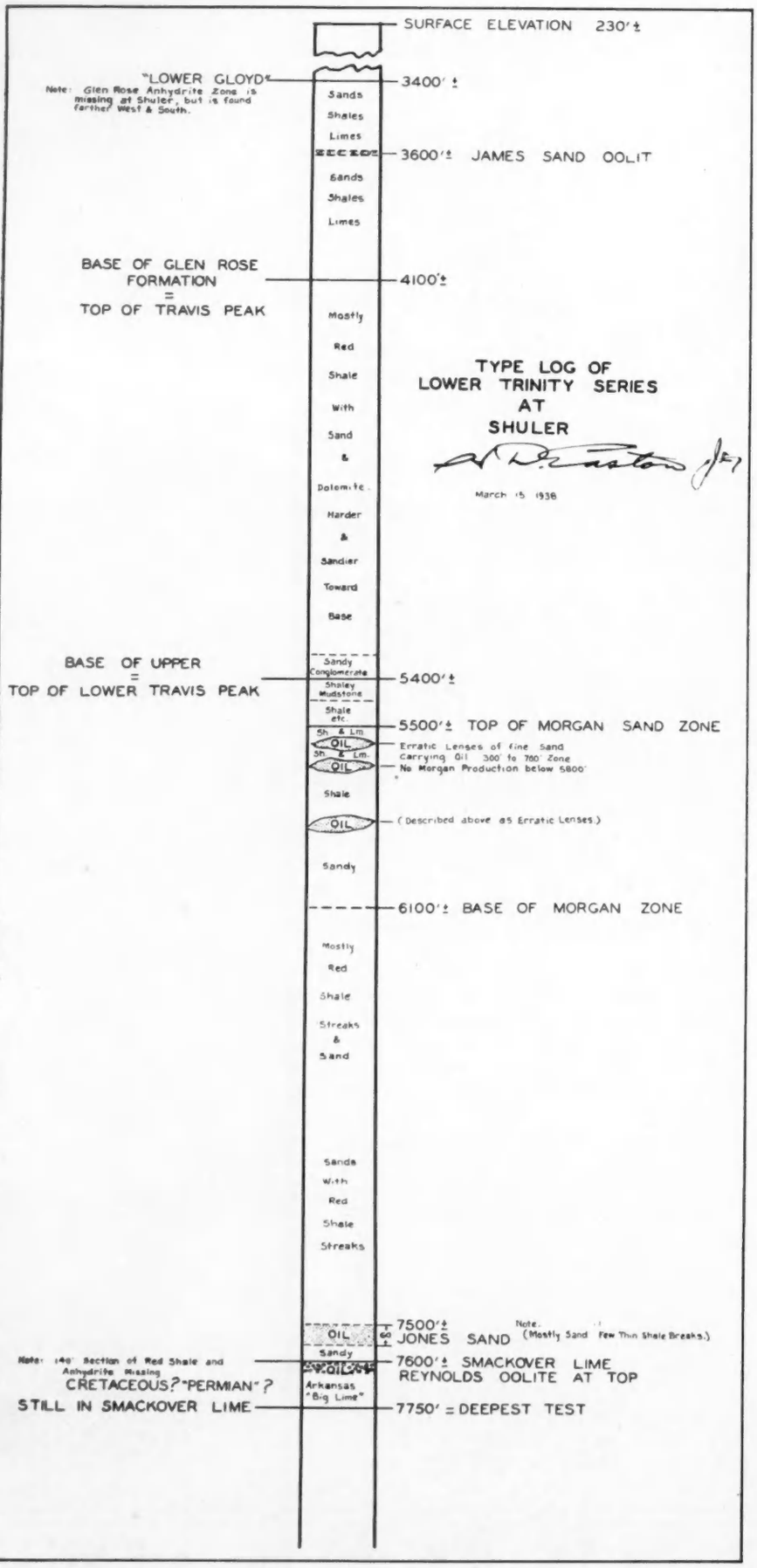
immediately below the fossiliferous Glen Rose, was found in the discovery well at 4040 feet and top of the Lower Travis Peak at 5380 feet. This



places the Morgan sand in the "Upper Lower Travis Peak," if you want to call it that. With the Jones sand coming in around 7500 feet and the Reynolds oolite of the Smackover lime at 7600 feet, we then know that the Jones sand is in the "Lower Lower Travis Peak" and that all Schuler's production is coming from beds in or adjacent to this lower marine zone. No well has yet gone through the Smackover lime at Schuler, so conditions in the lowest red beds and salt zone are not yet known. The accompanying sketch of the Schuler "type log" is self-explanatory.

Biggest boom in Arkansas deep exploration will follow in the wake of the Standard Oil Company of Louisiana's recent discovery in the Upper Smackover lime at Buckner, Columbia County, Arkansas. Standard Oil Company of Louisiana's John P. McKean 1, in Section 8-16s-22w, was completed in November, 1937, as a large oil well producing from 80 feet of saturated oolitic lime topped at 7204 feet. This lime is the same that was noted in Hays A-9 and other deep tests mentioned, and marks the first major oil production from the Reynolds oolite of the Smackover Lime.

With a derrick-floor elevation of 257 feet, McKean 1 found its "tops" at the following sub-sea depths: First Glen Rose anhydrite, 3018 feet; last Glen Rose anhydrite, 3158 feet; top of Travis Peak, 4043 feet; top of "lower" anhydrite, 6763 feet; top of Smackover lime, 6938 feet. This "lower" anhydrite is the same that was found above the "big lime" in the Gulf Oil Corporation Smackover deep test, and other wells, although it has not been noted at Schuler, it will doubtless be found off the flanks of that structure. Since it should have a name, to avoid confusion with the much younger Glen Rose anhydrite, it will probably be known as the "Buckner Anhydrite."

Other Significant Tests

Reference to the accompanying Ark-La-Tex map shows locations of all these wells noted and others to be discussed. Let us now consider a few more significant deep tests which show the presence of Lower Travis Peak beds over a widespread area. In the Garland City area of Miller County, Arkansas, E. H. Moore drilled Dale 2, Section 24-15s-26w, in 1937 to 7310 feet. This well, with an elevation of 250 feet, found the following "tops"; top Glen Rose Massive Anhydrite, 3750 feet; Base Massive Anhydrite, 3880 feet; top Travis Peak, 4637 feet; top of Lower

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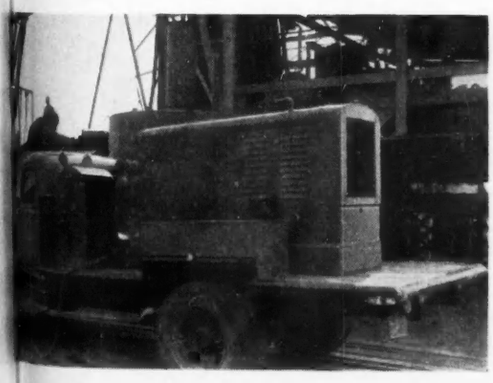

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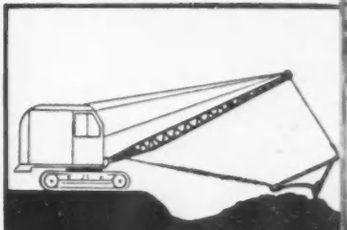

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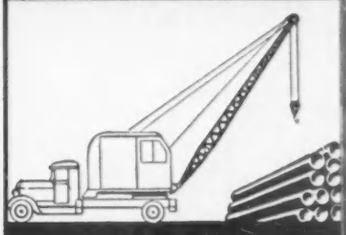

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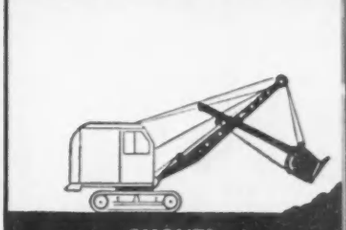

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Travis Peak, 5610 feet. The "Buckner" Anhydrite was missing and the Smackover lime, oolitic at top, was reached at 7278 feet and continued to the total depth. Perhaps this well should have prospected deeper, but at any rate it was important because it showed the "Big Lime" to be found over a widespread area.

Beset with mechanical difficulties and zones of salt water, Kerr-Lynn Oil Company's Barnett 1, Section 14-17s-20w, Columbia County, has shown the Smackover lime to be found midway between Buckner and Schuler and has now opened the third important field producing from this zone. Barnett 1 topped the Glen Rose Massive Anhydrite at 3146 feet and had a 58-foot section of this anhydrite; the "Buckner" anhydrite was first reached at 7445 feet and the Smackover lime at 7618 feet.

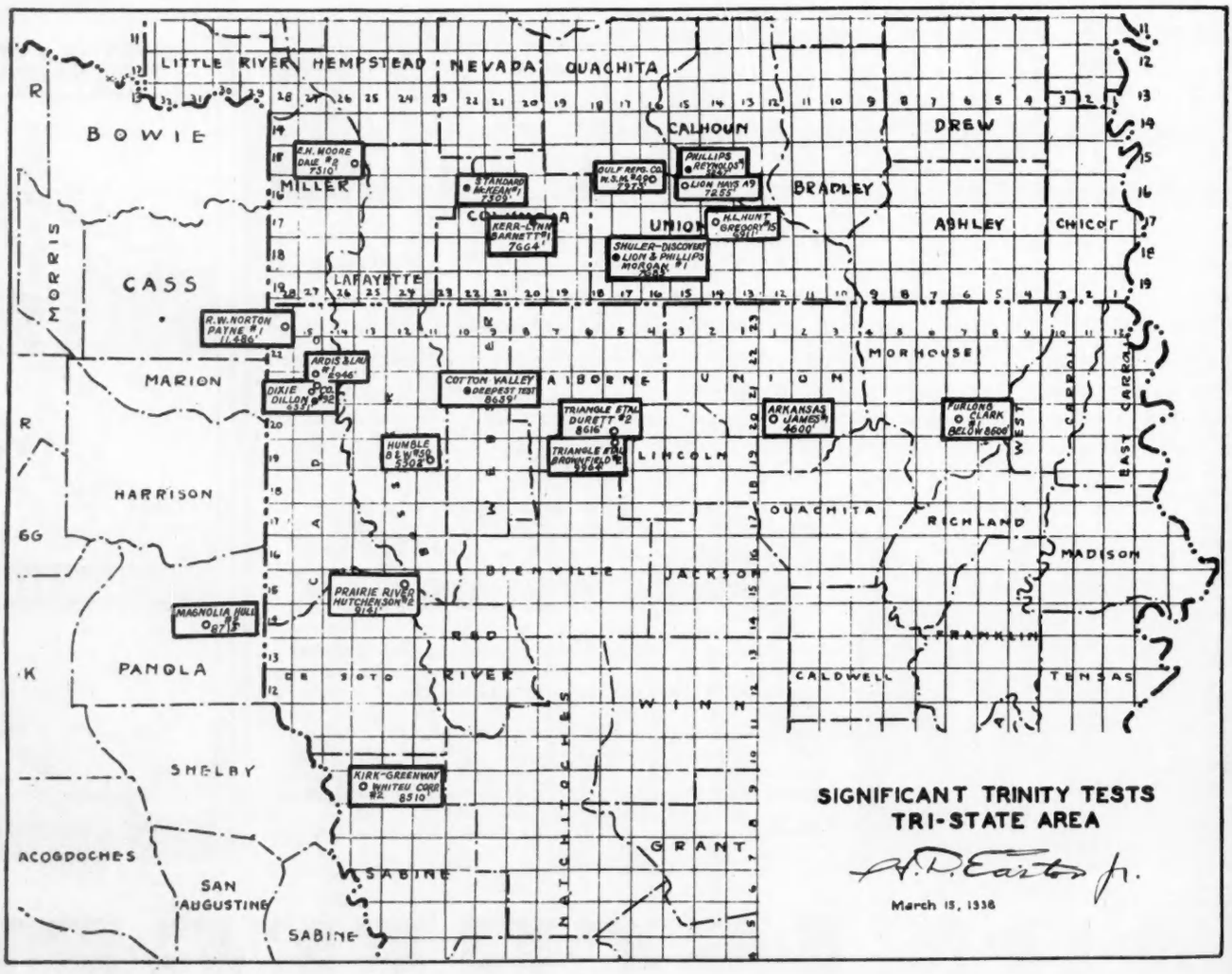
Continuing southeastward on the Garland City-Buckner-Kerr-Lynn-Schuler line, we find W. J. Furlong, Jr., et al's E. M. Clark 1, in Section 10-20n-7e, Morehouse Parish, Louisiana. I would not expect the true Smackover lime to run this far into the Northeast Louisiana Uplift area, however, this is an important test, geologically. It reported the Travis Peak at 2608 feet. Lower Travis Peak at 4910 feet; "Buckner" at 5815 feet; Smackover lime at 6207 feet, showing up here as a three or four foot oolitic streak noted in cuttings. The nature of the lime seems to have changed considerably and this well is really doing some prospecting into the unknown.

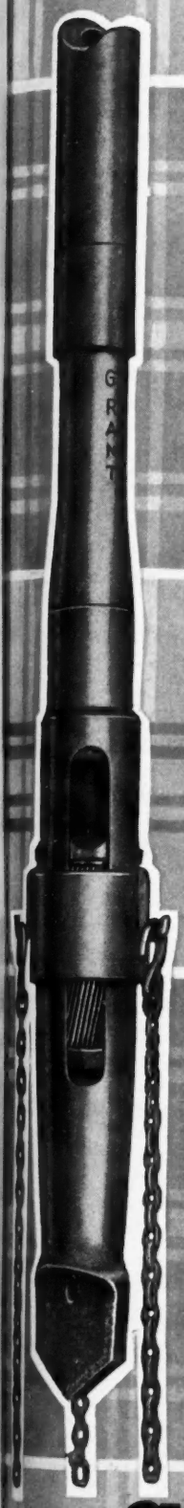
In the Sugar Creek field we find an important deep test in Standard of Louisiana et al's Brownfield 2, Section 5-19n-5w, which has no definite goal but has already gone to 9964 feet at which depth the hole was so crooked that it required plugging back to straighten. Topping the Lower Travis Peak at 7715 feet, Brownfield 2 was still in that formation at nearly 10,000 feet. Lower Travis Peak beds here were found to be predominately dark colored shales with a few thin streaks of sand and occasional lime streaks. The pioneer deep test at Sugar Creek, Addie Durrett 2 in Section 31-20-5, found many sands and many shows of oil and gas in both upper and lower Travis Peak, and in portions of the field production should be had from some of these beds. If continued, Brownfield 2 should open up another Smackover lime producing field at some depth below 10,000 feet.

Go southwest to Prairie River Syndicate's Hutchinson 1, Section 15-15n-12w, Caddo Parish, Louisiana, dry and abandoned at 9141 feet in late 1937. It runs as follows: First anhydrite 4243 feet; Base Massive anhydrite 4481 feet; Travis Peak around 5900 feet, Lower Travis Peak at 8380 feet. This well had much sand and some shows.

Then down to the Converse area with Kirk-Greenway's Whitney Corporation 2, Section 8-9-13, Sabine Parish, Louisiana, dry and abandoned at 8510 feet. The Glen Rose anhydrite zone did not have much anhydrite, first anhydrite at 5030 feet and base of lowest "stringer" at 4337 feet. Only six feet of solid anhydrite was found, 5030 to 5036 feet. Top of Travis Peak was 7090 feet and the well quit while still in Upper Travis Peak. Good bodies of sand were found, with some shows.

In Panola County, Texas, Magnolia Petroleum Company's E. A.





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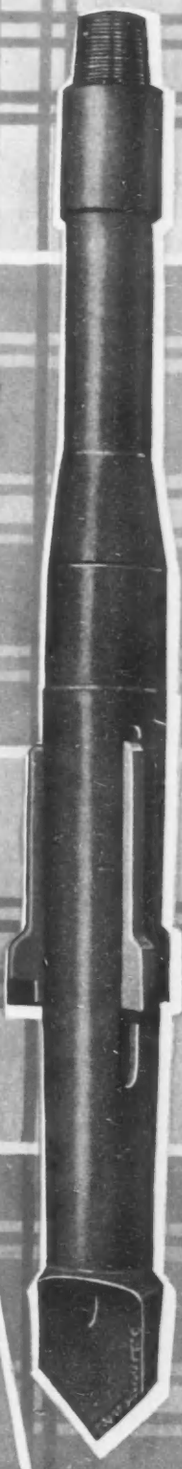

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Hull 2 logged Glen Rose Anhydrite in various stringers and solid beds between 3923 and 4884 feet with most of its anhydrite between 4650 and 4875 feet. Travis Peak was found at 6024 feet and Lower Travis Peak at 8075 feet. Many sands were encountered with shows of oil and gas and over 100 cores taken removed doubt as to formations encountered. Sand was cored from 8685 feet to the total depth of 8713 feet but as attempts to set 7-inch casing were unsuccessful, the 9⅝-inch was perforated from 5906 to 5936 feet and the well was completed as a gas-"distillate" producer.

Three Early Markers

Of historical importance are three older pioneer Trinity wells, also spotted on the map. First Glen Rose Anhydrite for the Sabine Uplift was cored in Louisiana Oil Refining Company's Ardis & Lay 1, Section 1-21-15, Caddo Parish, the old Pine Island field, in 1921, at 2604 feet. We still have a sample of this discovery Glen Rose Anhydrite core in our office. Oil production was found at Pine Island in honeycombed anyhydrite at 2812 feet. First Travis Peak was Dixie Oil Company's Dillon 92, drilled to 6351 feet in 1928 and 1929 and located in Section 13-21-15, Caddo Parish.

In 1928 with a total depth of 5302 feet, Humble Oil & Refining Company's Bliss & Wetherbee 30, Section 15-19-11, Bossier Parish, Louisiana, in the Bellevue field, prospected deep into the Lower Travis Peak and was thought to have penetrated Jurassic beds, but did not reach the "Big Lime." The sharp domal uplift at Bellevue placed the lower Glen Rose and the Travis Peak immediately below the Nacatoch, with the anhydrite pushed up and truncated; in other words about three thousand feet of chalk, Ozan, Tokio, Washita, Fredericksburg, Paluxy and Upper Glen Rose are missing. The Bellevue shallow production, coming from Nacatoch sand at depths less than 400 feet, set some sort of record for production per acre per feet of drilling depth, although producing area was limited. (Note: Some oil, gas and water has been found beneath the Glen Rose anhydrite at drilling depths of about 1800 feet, ouside the truncated area of Bellevue.)

Now that we have investigated all these key wells, what do we see? I would not recommend anyone's trying to make a cross-section showing these wells because no significant results would be had. We find the Glen Rose Anhydrite at drilling depths ranging from 2471 feet (Dillon 92, Pine Island) to 5077 feet (Payne 1, Rodessa) or missing entirely. We find it at 3750 feet in Dale 2 (Garland City, Arkansas), about 40 miles south of the Glen Rose outcrops, and only 200 feet deeper in Panola County Texas, (Magnolia's Hull 2), nearly 120 miles south of the outcrops. All which tends to show that the Ark-La-Tex area is one abounding in major and minor structural features from major unconformities to salt domes, and that long-distance correlation is unreliable.

Limits Not Reached

Of greater importance, we find thick Upper and Lower Travis Peak sand sections already established over a very large area with limits not yet reached. Because these sands have been proven highly productive at Cotton Valley and Schuler, we feel that additional fields of the same caliber will be found.

We find the Smackover Lime with worthwhile production in Schuler, Kerr-Lynn and Buckner and its presence established over a great portion of southwestern Arkansas with no limits yet reached toward the west, and a rosy future for Smackover lime production in many areas.

Only two wells (Gulf's Lewis Werner Saw Mill 49 and Hunt's Gregory 15) both in areas of known igneous activity, have gone through the red shale and salt section underlying the Smackover Lime and each of these wells went into igneous rock. As depletion of known reserves takes place and drilling depths are increasingly greatened, someone will drill a well in the western portion of the Ark-La-Tex area through the Upper and Lower Travis Peak, past the Smackover Lime, through the lowest red beds and salt and to what? That remains to be seen, but I feel that additional productive horizons will be found. The age of the lowest red shales and salt is problematical; it is thought to be perhaps Jurassic, maybe still Cretaceous, call it "Jura-Cretaceous." The Smackover Lime would probably be of the same age; it could be Jurassic; oolitic lime is not an indication only of Glen Rose; the Jurassic abounds in so much oolitic material that European geologists call it the "Oolitic."

On the Paleozoic outcrops in the DeQueen-Murfreesboro region of Arkansas, the Mississippian is seen on the surface, standing almost perpendicularly; farther south wells have penetrated what has been definitely identified as Pennsylvanian beds. We know that the sequence runs like this, from top to bottom: *Mesozoic,* Upper and Lower Cretaceous, Jurassic, Triassic; *Paleozoic,* Permian, Pennsylvanian, Mississippian, etc. We have found the Mississippian and Pennsylvanian to the north, but in our deepest wells in Smackover and southward we have not gone completely out of the Mesozoic, therefore until an Ark-La-Tex well west and south of Smackover goes through the Mesozoic and encounters Paleozoic beds older than Permian, we can logically expect to find the true Permian. Meanwhile, call a producing lime by any other name and the crude smells just as sweet to the operator and we'll take "Smackover Lime" production by any name and be glad to get it.

In an article on the Glen Rose (Oil & Gas Journal, July 8, 1937) I said "no Glen Rose test should be considered a failure unless and until all the Glen Rose beds have been proven unproductive. Production can be found in any one of these main zones (enumerated for various fields) or in "stray" sands not otherwise classified, even though all the other zones be barren." Without advocating that every test well be drilled to some Ultima Thule several miles down in the Paleozoics I would now say that although economics or mechanics of extremely deep drilling may necessitate abandonment of a test well without prospecting all potential producing horizons, no part of Ark-La-Tex with local structure need be considered without hope for production unless and until all the present known productive horizons have been tested; and there is a probability of additional pay zones being discovered.

Great Promise

With so many established producing zones of various ages, with so many local structures shown by some 70 or 80 producing fields and by numerous interior salt domes, it is no wonder that operators are beginning to realize that the Ark-La-Tex or Tri-State area offers great promise for future production, and that this area is due for an extremely active exploration and exploitation campaign. And despite the admittedly most important promise offered by beds of Lower Cretaceous age, or older, remaining possibilities for new production in the Upper Cretaceous should not be overlooked; additional new fields and significant extensions of older producing areas will be found in the Upper Cretaceous in the Tri-State area.

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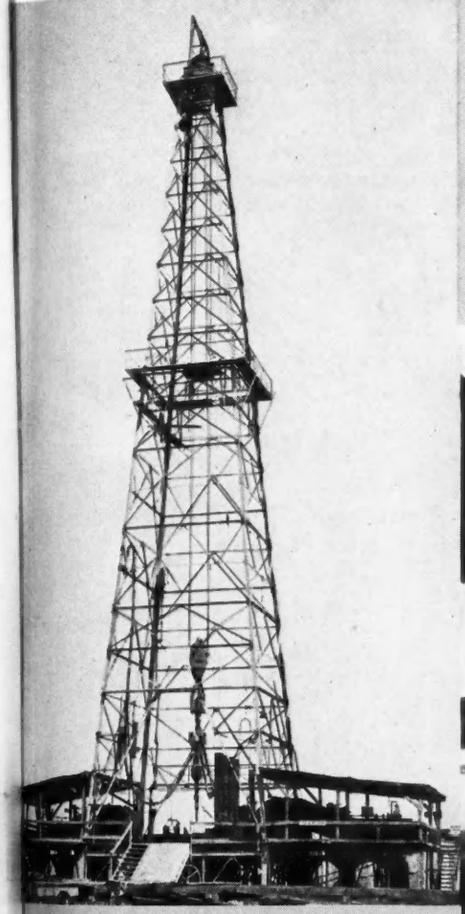

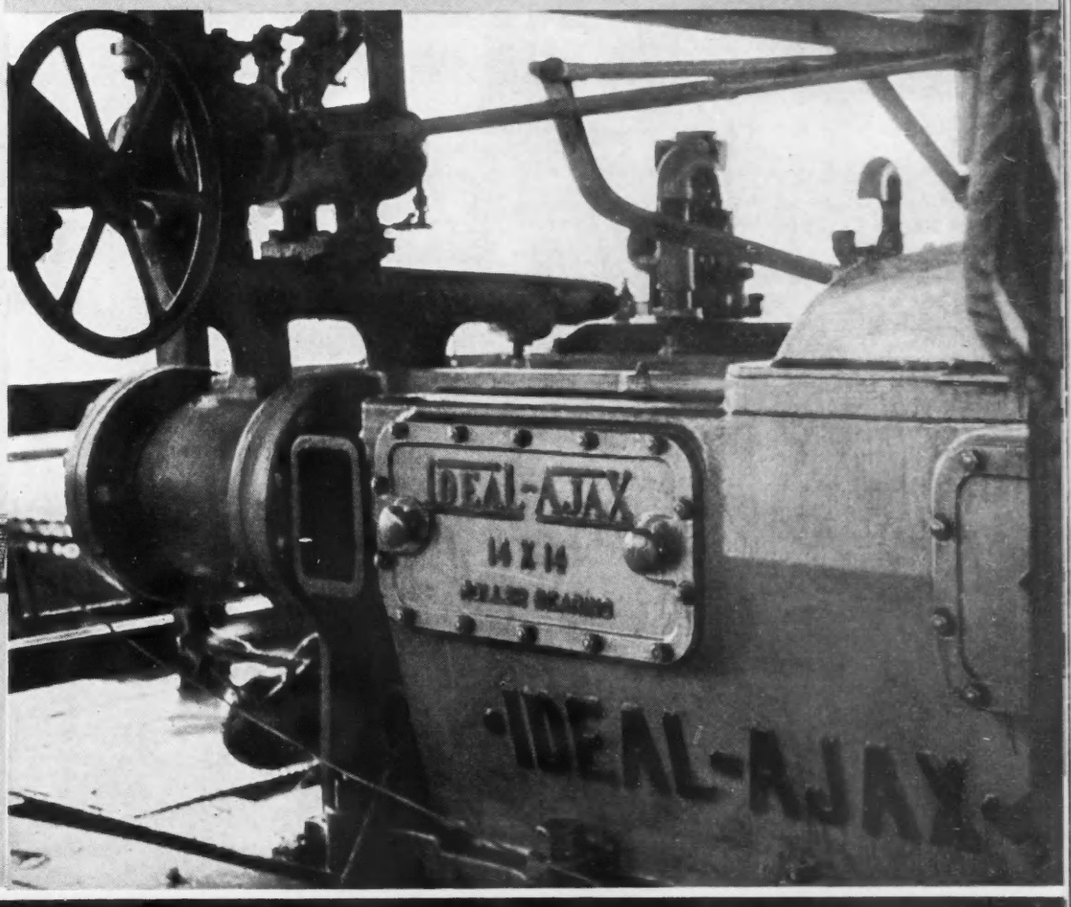

Here's an unusual application of the Ideal-Ajax, showing its remarkable versatility. The Brookshire No. 1 in the Coastal Louisiana field uses a large double draw-works equipped with an Ajax 14x14 and an Ajax 12x12 for the auxiliary draw-works. In this well the longest, heaviest string of 7⅝" casing ever run was successfully cemented. Length of string, 11,342 feet. Total load, 481,628 pounds.

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ARK-LA-TEX

Production

Viewed either from the past present, or future, region is one of most important producing districts in the United States

By L. J. LOGAN
Associate Editor

THE region that is given special treatment in this issue, conveniently designated as the Ark-La-Tex district, and embracing Arkansas, North Louisiana, and Eastern Texas, is one of the most important areas in the United States from a production standpoint.

This importance is based, moreover, on all phases of crude oil production, prospective, present, and past. The area also is exceptionally important for its potential, current, and past production of natural gas.

Has 20% U. S. Reserves

From the standpoint of indicated future crude oil production, the Ark-La-Tex district ranks among the most prominent in the country. The known recoverable crude oil reserves in the established fields of the area aggregate roughly 3¼ billion barrels, or 20 percent of the 15½ billion barrel total in the United States.

The area is under strict proration, and its daily production at present is held somewhat below its

Northern Louisiana Crude Oil Production, by Fields, by Years

Complete Production History of District, in Barrels of 42 U. S. Gallons

(Sources.—Except as otherwise indicated in footnotes, figures are from annual volumes of *Mineral Resources* and *Minerals Yearbook.*)

YEAR	Bellevue Bossier Parish	Bossier Parish	Caddo Parish	Converse Sabine Parish	Cotton Valley Webster Parish	DeSoto Parish	Elm Grove Bossier Parish	Haynesville Claiborne Parish	Holly De Soto Parish	Homer Claiborne Parish
1906			3,358							
1907			50,000							
1908			499,937							
1909			1,028,818							
1910			5,090,793							
1911			6,995,828							
1912			7,177,949							
1913			9,781,560							
1914			7,572,254			[A]3,834,593				
1915			6,471,879			1,797,175				
1916			5,463,682			1,657,216				
1917		36,188	5,483,638			1,370,889				
1918		45,138	11,143,890			1,065,847				
1919			[B]8,700,000			[B]1,200,000				[B]2,000,000
1920			6,336,000			[C]				21,508,000
1921			5,342,000			719,000		3,161,000		13,030,000
1922	1,050,000		4,498,000			531,000	160,000	19,939,000		5,673,000
1923	2,351,000		4,178,000			429,000	220,000	10,496,000		3,581,000
1924	1,749,000		4,319,000		1,211,000	353,000	217,000	6,720,000		2,837,000
1925	1,129,000		4,067,000		3,348,000	305,000	212,000	4,604,000		2,296,000
1926	788,000		4,749,000		2,914,000	321,000	222,000	3,328,000		2,033,000
1927	472,000		5,789,000		1,968,000	541,000	222,000	2,600,000		1,785,000
1928	323,000		4,798,000		1,731,000	463,000	185,000	2,150,000		1,548,000
1929	255,000		[D]4,589,000		1,040,000	276,000	178,000	1,806,000		1,405,000
1930	233,000		4,120,000		880,000	247,000	172,000	1,743,000	308,000	1,278,000
1931	93,000		3,054,000		509,000	192,000	149,000	1,902,000	189,000	1,083,000
1932			2,486,000		353,000	469,000	109,000	1,534,000	99,000	1,021,000
1933			2,248,000		307,000	411,000	107,000	1,402,000	74,000	991,000
1934	85,000		2,200,000	[E]665,000	290,000	398,000	116,000	1,379,000	65,000	980,000
1935	202,000		2,630,000	521,000	233,000	379,000	95,000	1,266,000	56,000	977,000
1936			[F]2,386,900	[F]251,400		[F]504,000		[F]1,217,050		[F]948,550
1937			[F]2,363,400		[F]880,050	[F]538,500		[F]1,164,750		[F]919,300
Total	8,730,000	81,326	145,616,886	1,437,400	15,664,050	18,002,870	2,364,000	66,411,800	791,000	65,893,850

See footnotes page 58

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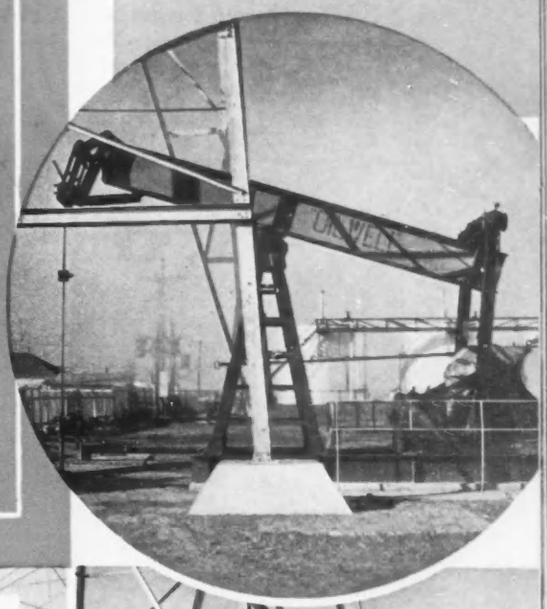
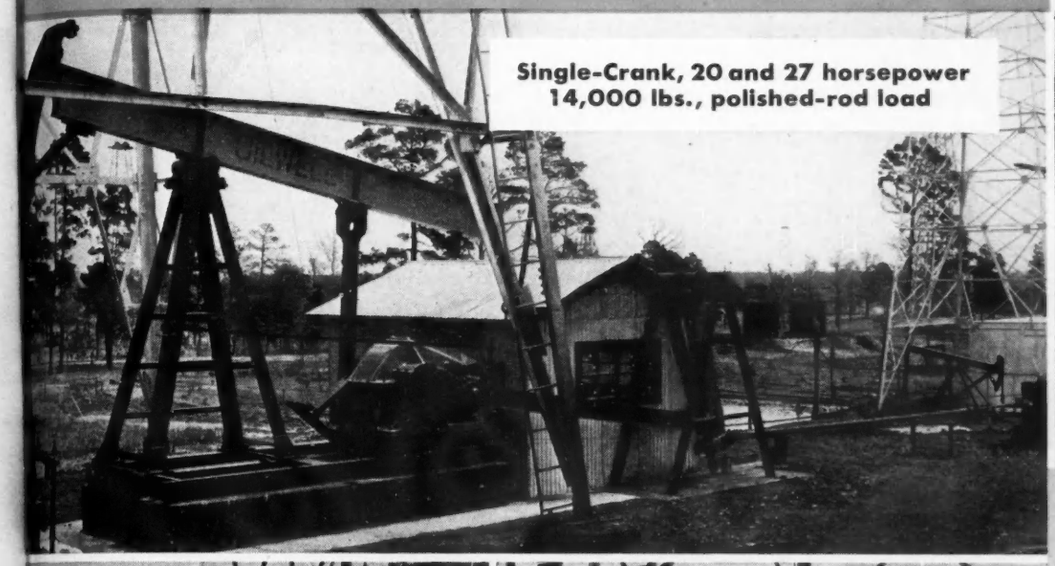
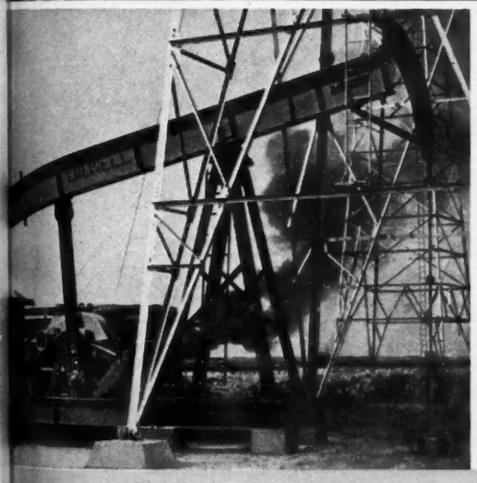


Twin-Crank, 27 and 35 horsepower
25,000 lbs., polished-rod load



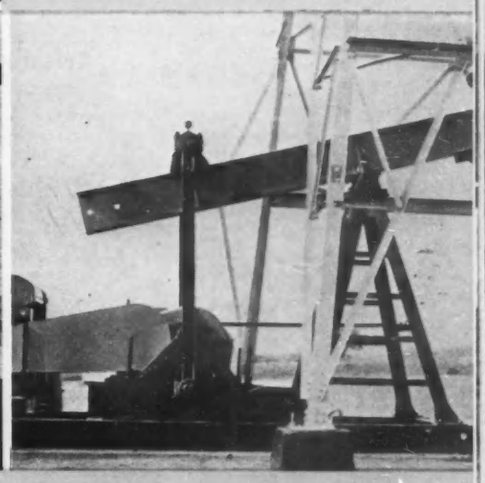
Single-Crank, 20 and 27 horsepower
14,000 lbs., polished-rod load

Twin-Crank, 27 horsepower
20,000 lbs., polished-rod load



Single-Crank, 27 and 35 horsepower
20,000 lbs., polished-rod load

Single-Crank, 10 horsepower
10,000 lbs., polished-rod load



Twin-Crank, 20 horsepower
14,000 lbs., polished-rod load

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Northern Louisiana Crude Oil Production, by Fields, by Years—(Continued)

YEAR	Lisbon	Pleasant Hill	Red River Parish	Rodessa		Sarepta	Urania	Zwolle		Total Northern Louisiana
		Sabine Parish	Bull Bayou-Crichton	Caddo Parish	Sabine Parish	Bossier Parish	LaSalle-Grant-Winn Parishes	Sabine Parish	Unclassified	
1906										3,358
1907										50,000
1908										499,937
1909										1,028,818
1910										5,090,793
1911										6,995,828
1912										7,177,949
1913										9,781,560
1914			401,622		[A]					11,808,469
1915			6,802,349		10,631					15,082,034
1916			4,691,323		9,421					11,821,642
1917			1,664,955		6,293					8,561,963
1918			1,045,263		4,261					13,304,399
1919			[B]2,900,000						79,000	14,879,000
1920			[C]5,923,000							33,767,000
1921			2,844,000						77,000	25,173,000
1922			1,778,000							33,629,000
1923			1,207,000						7,000	22,469,000
1924			1,231,000							18,637,000
1925			1,074,000				10,000			17,045,000
1926			1,037,000				3,669,000			19,061,000
1927			1,070,000				3,321,000			17,768,000
1928			1,109,000				2,487,000			14,794,000
1929		[E]	987,000			[D]	2,155,000	[K]409,000		13,100,000
1930		178,000	838,000			[F]888,000	1,976,000	1,801,000		14,662,000
1931		115,000	713,000			[F]259,000	1,448,000	2,538,000		12,244,000
1932		85,000	257,000			[F]119,000	1,208,000	2,451,000		10,191,000
1933		[G]	190,000			[G]242,000	883,000	3,007,000		9,862,000
1934		[H]	145,000			[H]	1,077,000	1,675,000		9,075,000
1935		[H]	143,000	1,364,000		[H]	1,062,000	626,000		9,554,000
1936		[H]		[I]19,003,750		[H]	[I]1,015,750	[I]410,050	[I]1,220,200	26,958,250
1937	2,275,000	[H]		[I]17,826,000		[H]	[I]1,022,150	[I]71,350	[I]1,550,100	28,610,650
Total	2,275,000	378,000	38,051,512	38,193,750	30,606	1,508,000	21,333,900	12,988,400	2,933,300	442,685,650

[A] DeSoto includes Sabine Parish.
[B] Estimated.
[C] DeSoto included with Red River.
[D] Caddo includes Carterville and Sarepta.
[E] Zwolle includes Pleasant Hill.
[F] Sarepta includes Carterville.
[G] Sarepta includes Carterville and Pleasant Hill.
[H] Converse includes Pleasant Hill and Sarepta.
[I] Calculated by THE OIL WEEKLY from weekly reports of the American Petroleum Institute.
[J] Represents Caddo field, Light and Heavy, and does not include Rodessa field.
[K] DeSoto Parish includes Red River Parish.

proportionate share of the national output on the basis of crude reserves. The current daily production is about 19 percent of the United States total.

The Ark-La-Tex district already has produced nearly 2½ billion barrels of crude oil, or about 12 percent of the United States all-time production of approximately 20 billion barrels.

In the area centering around the Arkansas, North Louisiana, and Eastern Texas borders are located some of the most important oil and gas fields of the world.

Some of these fields have been discovered in recent years. The

Arkansas Crude Oil Production, by Fields, by Years

Complete Production History of State, in Barrels of 42 U. S. Gallons.

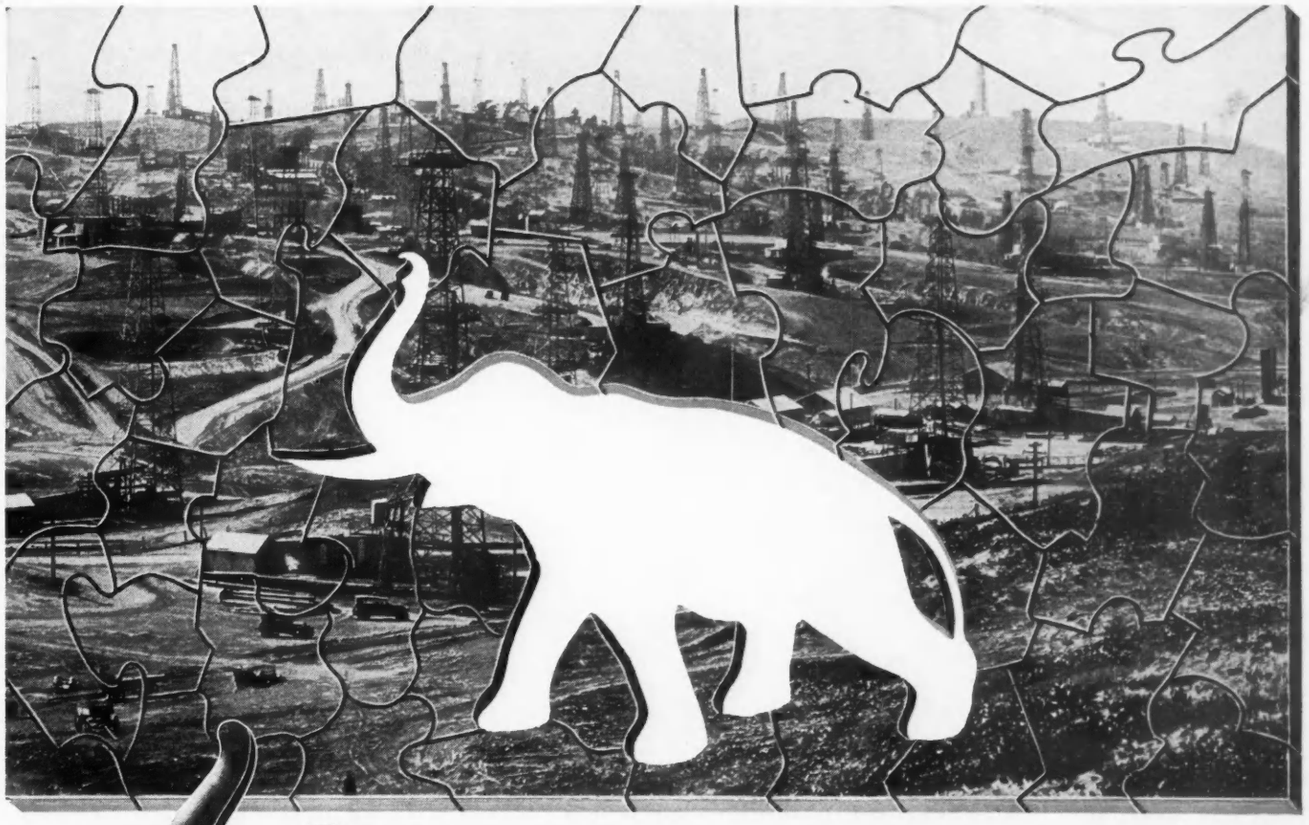
(Sources.—Annual Volumes of *Mineral Resources* and *Minerals Yearbook*.)

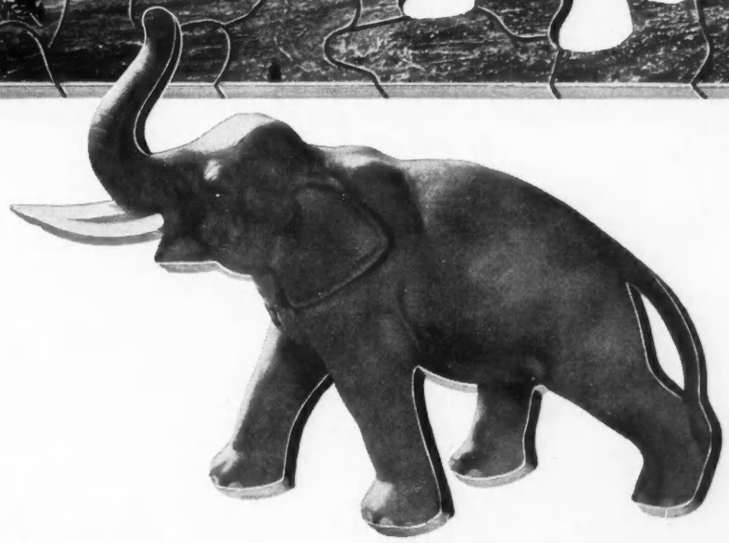
YEAR	Bradley	Champagnolle	El Dorado	Irma	Lisbon		Mount Holly	Rodessa	Schuler	Smackover	Stephens	Urbana		Total Arkansas
	La Fayette County	Union County	Union County	Nevada County	Union County	Miller County	Union County	Miller County	Union County	Ouachita-Union Counties	Ouachita-Columbia Counties	Union County	Unclassified	
1920														[A]
1921			10,473,000											10,473,000
1922			10,592,000							2,107,000	13,000			12,712,000
1923			5,830,000	[B]						30,048,000	[B]732,000			36,610,000
1924			4,760,000	450,000						40,000,000	818,000			46,028,000
1925			4,247,000	334,000						72,144,000	673,000			77,398,000
1926	52,000		2,722,000	763,000	2,125,000					52,063,000	607,000			58,332,000
1927	44,000	[C]	[C]2,433,000	774,000	1,054,000					35,201,000	499,000			40,005,000
1928	31,000	3,522,000	2,456,000	536,000	566,000					24,569,000	416,000			32,096,000
1929	24,000	2,651,000	1,987,000	409,000	492,000		[D]			[D]18,991,000	363,000			24,917,000
1930	19,000	1,486,000	1,424,000	380,000	399,000		34,000			15,405,000	319,000	236,000		19,702,000
1931	5,000	944,000	1,186,000	266,000	288,000		4,000			11,504,000	272,000	322,000		14,791,000
1932		623,000	1,182,000	234,000	143,000					9,510,000	213,000	146,000		12,051,000
1933		488,000	1,231,000	264,000	95,000	100,000				8,882,000	127,000	499,000		11,686,000
1934		486,000	991,000	300,000	89,000	364,000				7,916,000	210,000	826,000		11,182,000
1935		872,000	862,000	391,000	66,000	444,000				7,368,000	212,000	793,000		11,008,000
1936		[E]979,900	[E]774,250					1,240,150	1,079,950	[E]7,273,950			[E]1,648,350	[E]10,676,450
1937		[E]349,650	[E]725,750							[E]6,915,150			[E]1,825,450	[E]12,136,100
Total	175,000	12,401,550	53,876,000	5,101,000	5,317,000	908,000	38,000	1,240,150	1,079,950	349,897,100	5,474,000	2,822,000	3,473,800	441,803,550

[A] Small production only, being first for the state, reported in Southwestern Ouachita County.
[B] Irma included with Stephens.
[C] Champagnolle included with El Dorado.
[D] Mount Holly included with Smackover.
[E] Calculated by THE OIL WEEKLY from weekly reports of the American Petroleum Institute.

"AMERICANS" . . .

fit the picture best!





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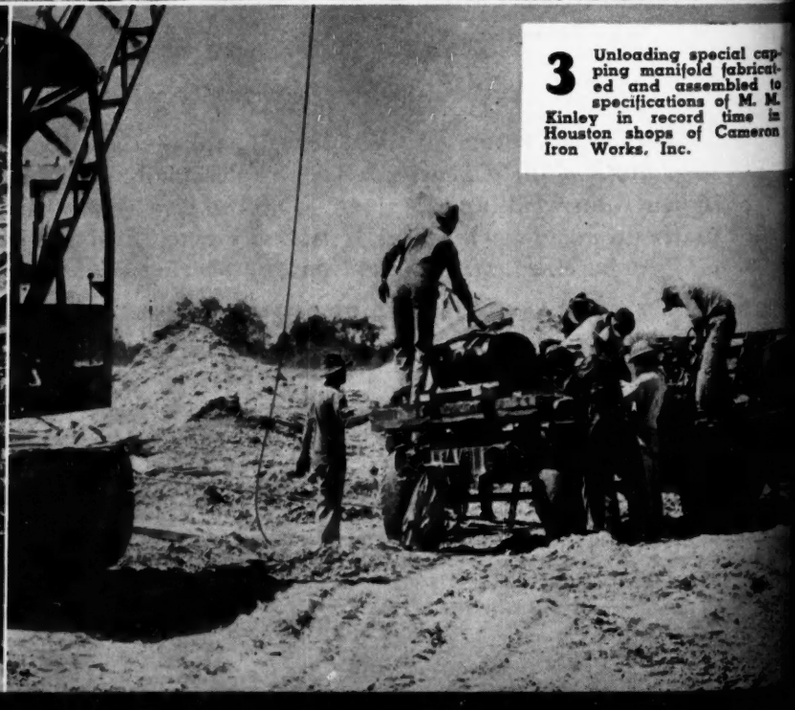
IT HAPPENED AGAIN

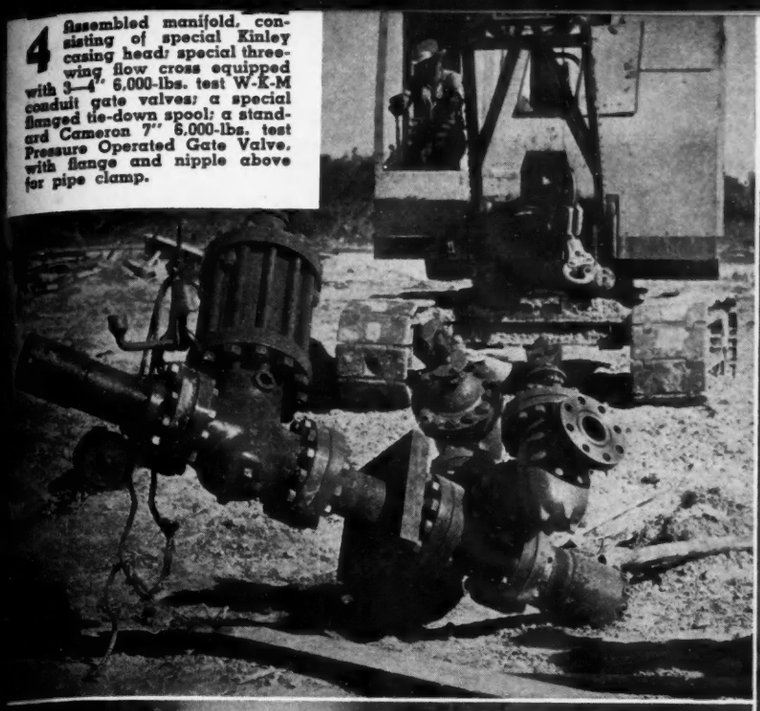
—This Time at La Blanca!

1 Appearance of Davenport No. 1. D. D. Oil Company, La Blanca, Texas, when M. M. Kinley Company contracted to start capping operations, February 22. Estimated volume of well 100,000,000 cubic feet of gas and oil at 2200 pounds closed-in pressure. Depth of crater 70 feet below grade level.

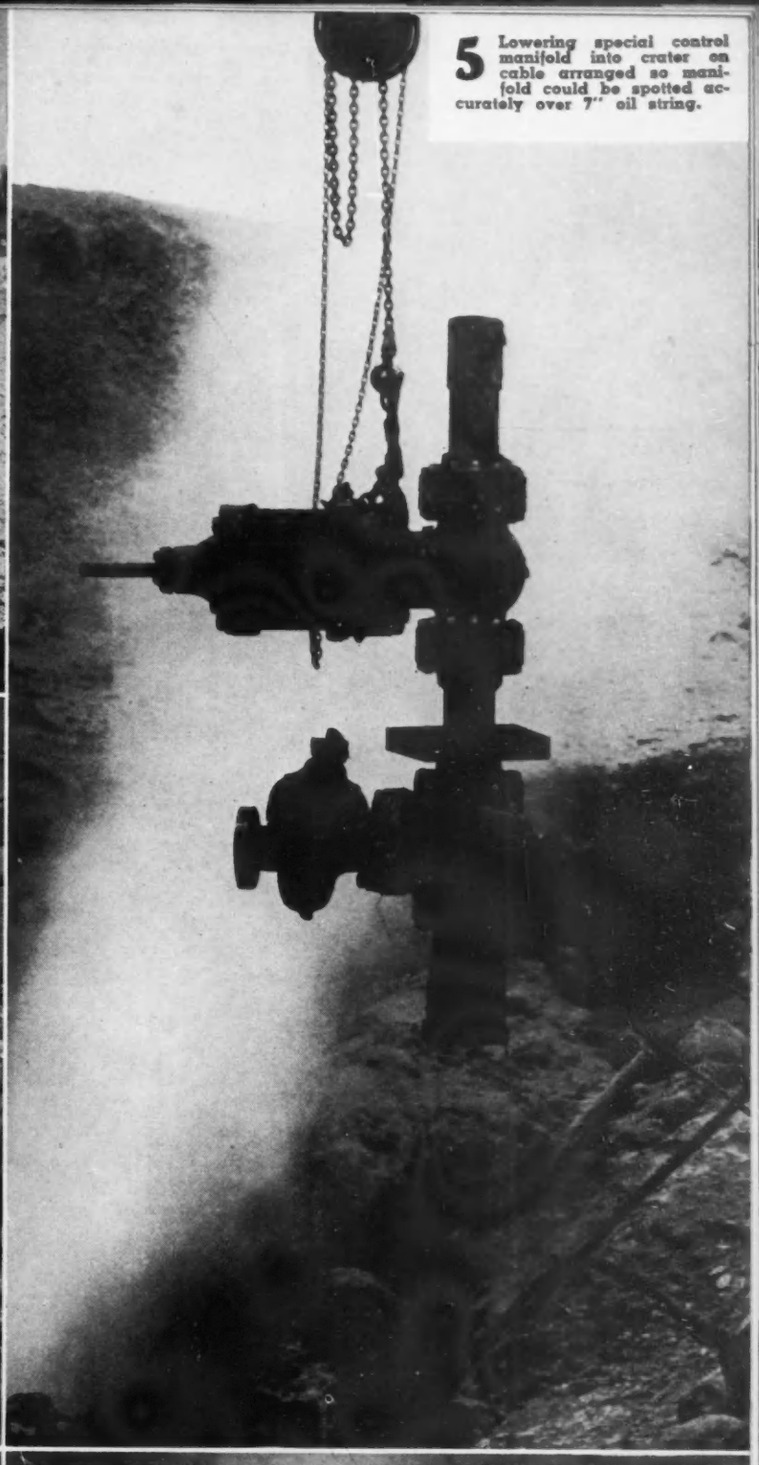
2 Close-up view of bottom of crater, showing 7" oil string projecting above water. Note angle of casing, which greatly increased difficulty of capping.



3 Unloading special capping manifold fabricated and assembled to specifications of M. M. Kinley in record time in Houston shops of Cameron Iron Works, Inc.

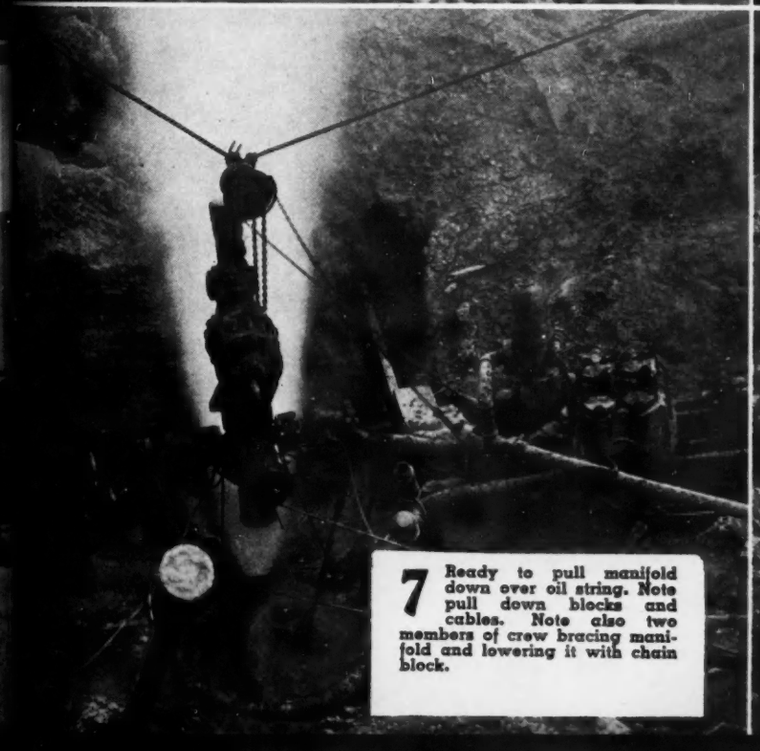


4 Assembled manifold, consisting of special Kinley casing head; special three-wing flow cross equipped with 3—4" 6,000-lbs. test W-K-M conduit gate valves; a special flanged tie-down spool; a standard Cameron 7" 6,000-lbs. test Pressure Operated Gate Valve, with flange and nipple above for pipe clamp.



5 Lowering special control manifold into crater on cable arranged so manifold could be spotted accurately over 7" oil string.

6 Manifold being "steered" toward 7" oil string by members of M. M. Kinley crew.

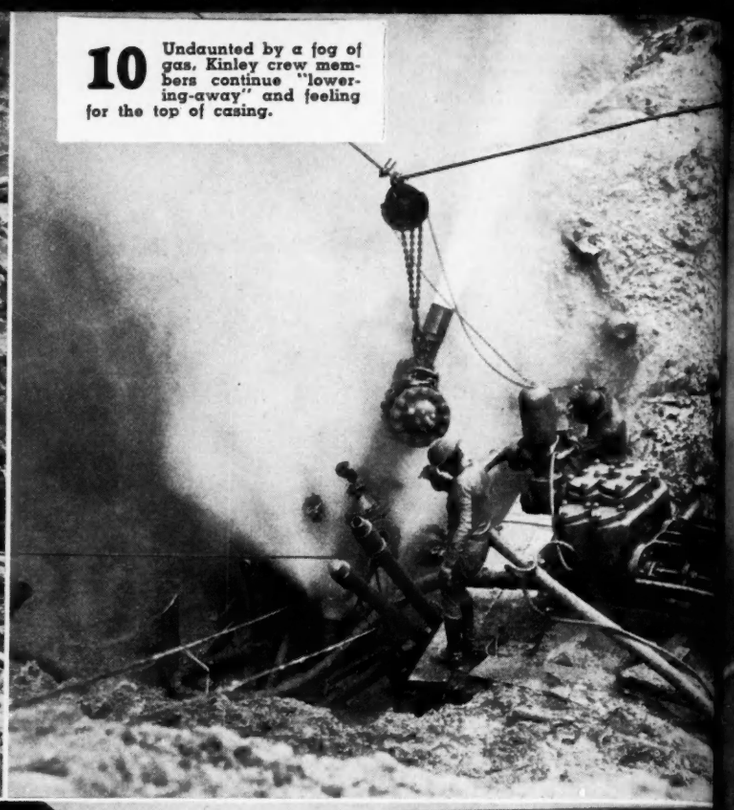


7 Ready to pull manifold down over oil string. Note pull down blocks and cables. Note also two members of crew bracing manifold and lowering it with chain block.

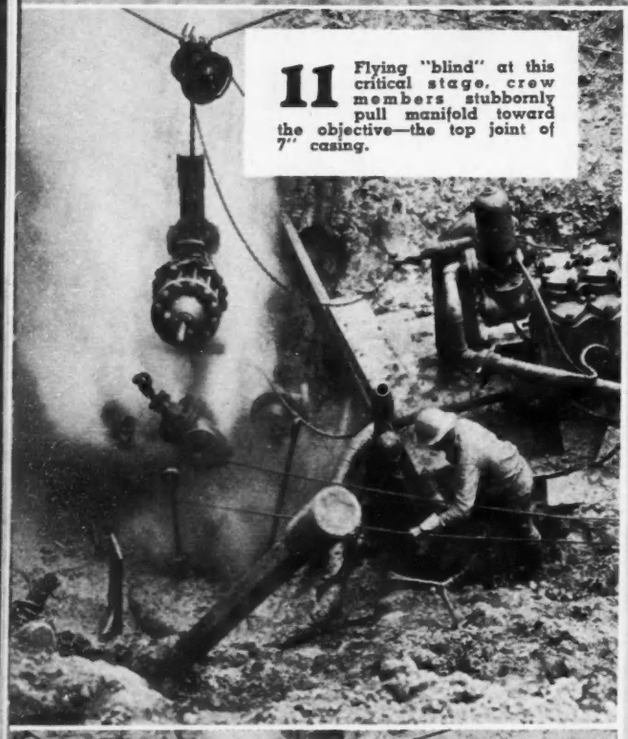
8 "Holding everything" and approaching the critical point in the capping operation.

CONTINUED

9 Capping manifold enters well stream and the hazard to workmen multiplies.

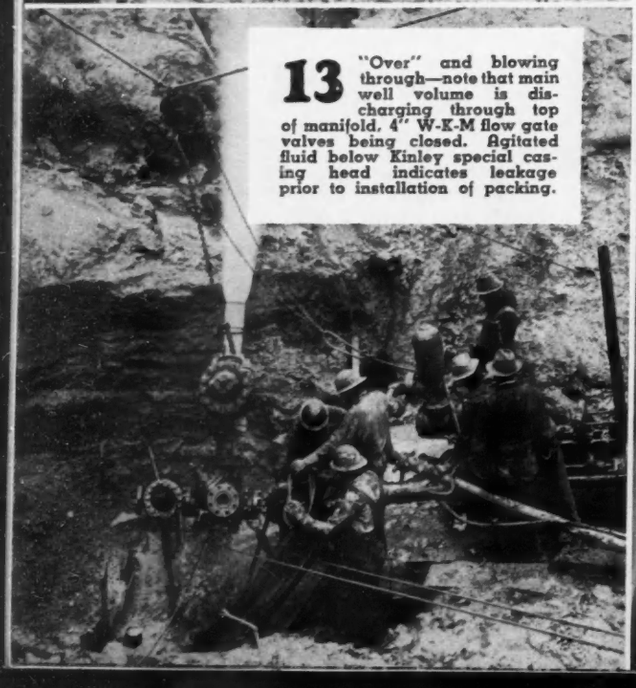


10 Undaunted by a fog of gas, Kinley crew members continue "lowering-away" and feeling for the top of casing.



11 Flying "blind" at this critical stage, crew members stubbornly pull manifold toward the objective—the top joint of 7" casing.

12 A daring close-up take by Harry Pederson, com mercial photographer McAllen, Texas, a few tense moments before succes crowned the strategy and effort of the Kinley crew. The man i the immediate foreground i Floyd Kinley.



13 "Over" and blowing through—note that main well volume is discharging through top of manifold. 4" W-K-M flow gate valves being closed. Agitated fluid below Kinley special casing head indicates leakage prior to installation of packing.

14 With capping manifold tied down snugly, and casing head packed, 4" W-K-M gate valves are opened to reduce back-pressure to a minimum. While flow-lines were laid, separators set, etc., WELL FLOW BLEW OPEN THROUGH W-K-M FLOW VALVES AND CAMERON PRESSURE OPERATED MASTER VALVE FOR MORE THAN 4 DAYS.

16 Under control after 61 days of blowing wild and cratering!

15 Close-up of manifold immediately prior to moment Cameron pressure operated master gate was closed. Note that flow valves have been connected to 4" lines to separators.

The obvious lesson to be drawn from the prompt and successful capping of Davenport No. 1, La Blanca, Texas, as well as No. 1 Bayshore Farms, Palacios, Texas, on January 12, 1938, is that equipment designed to withstand substantial cutting action and still seal off tightly is worth whatever it costs in a capping manifold built to specific requirements. It is also obvious that extensive and versatile shop facilities, and men experienced in fabricating and assembling special manifolds quickly, are indispensable factors in getting the job done promptly, correctly and satisfactorily. Cameron Iron Works, Inc., invites operators who require assistance in emergencies to make full use of its facilities and experience.

CAMERON IRON WORKS, INC.

711 Milby Street Houston, Texas

more recent discoveries include Schuler and Buckner in Arkansas, deep producing areas that represent the largest fields found in the state in many years. New fields of much importance in North Louisiana include Lisbon and Cotton Valley deep horizons.

Prior to the opening of these fields came the exceptionally important Rodessa field, which has extended into all three states, Arkansas, Louisiana and Texas. Its importance was so great that in its early stages of development it threatened to upset the industry's markets, although proration actually prevented such a development.

With a productive area which may eventually total over 30,000 acres, and which may yield about ¼ billion barrels of oil, Rodessa ranks among the most important fields ever found in the country.

World Famous Field

The Ark-La-Tex area also includes the world's greatest oil field, East Texas—greatest when judged from almost any standpoint, such as area, indicated ultimate recovery, actual past production, expected remaining production, current output, and until recently drilling activity.

East Texas, despite its relatively short life so far of only about 7½ years, has produced more crude oil than any other field in the world, although some have been steadily producing for 40 years or longer. Through 1937, the East Texas field had produced 1,132,400,220 barrels of crude oil. It is the only field in the world that has yielded a billion barrels. In fact, no other presently known field is expected to yield an ultimate output of as much as a billion barrels.

And East Texas, despite its heavy production already, has before it an indicated output of around 2 billion barrels, which would bring the ultimate yield to about 3 billion barrels. It has an area of about 132,000 acres and currently has approximately 25,000 producing wells, yielding about 20 barrels daily each when not shut in on Sundays. Drilling has continued active in the field despite the intensive development that already has taken place. There are still about 85 rigs in operation in the field, the most for any single field in the United States except K-M-A in North Texas, where the heavy development of the new deep pay is under way.

The all-time production of nearly 2½ billion barrels in the Ark-La-

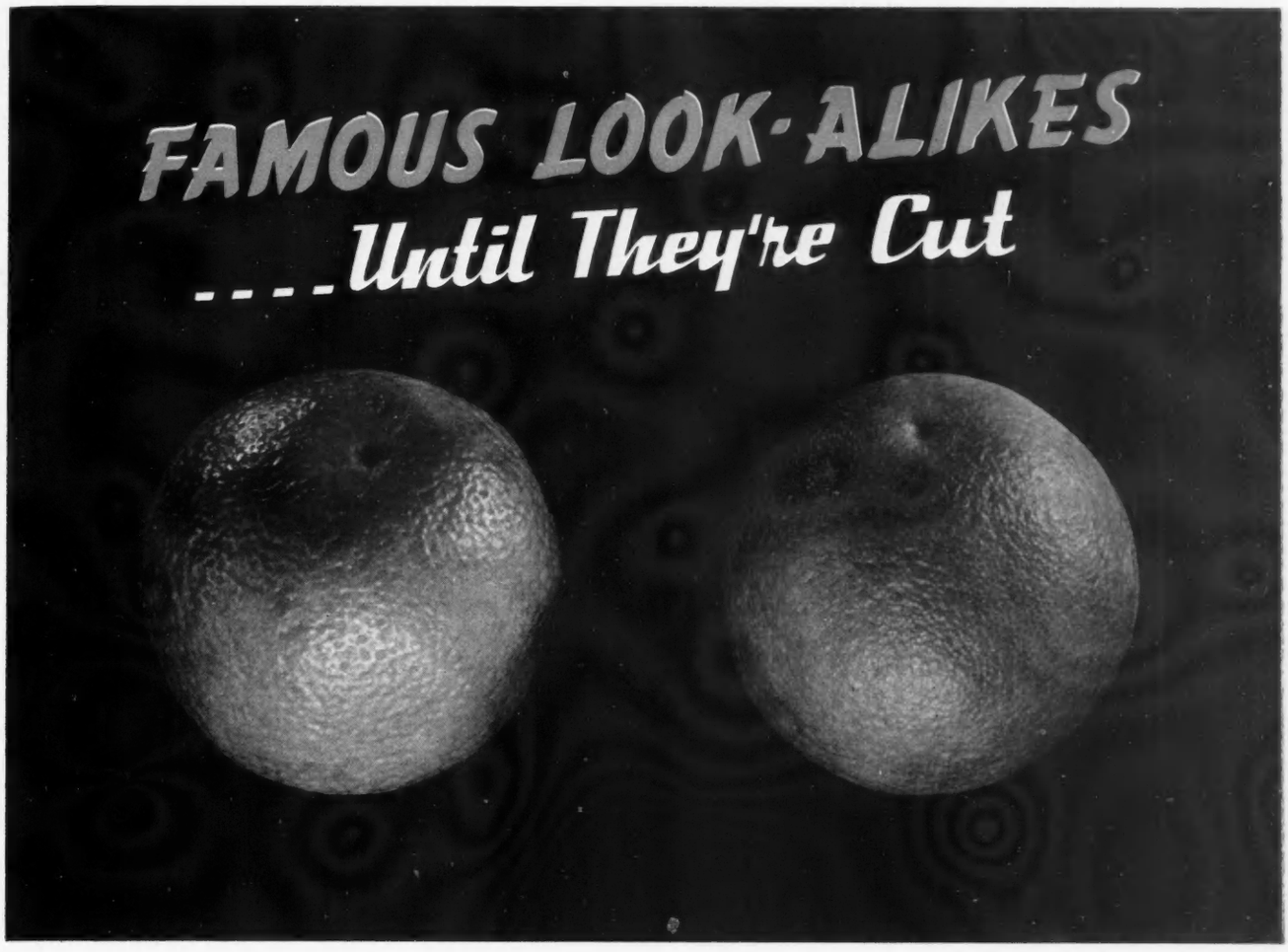
East and East Central Texas Crude Oil Production, by Fields, by Years

Complete Production History of District, in Barrels of 42 U. S. Gallons

(Sources.—Except as otherwise indicated in footnotes, figures are from records of oil companies.)

YEAR	Bethany	Beggy Creek	Camp Hill	Cayuga	Cedar Creek	[A]Corsicana	Currie	East Texas Field	Ginter	Haynes	Long Lake
	Panola County	Anderson-Cherokee Counties	Anderson County	Anderson-Freestone-Henderson Counties	Limestone County	Navarro County	Navarro County	[I]Five Counties	Angelina County	Henderson County	Anderson-Gresetone-Leon Counties
1887	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1888	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1889–1894	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1895	.....	.....	.....	.....	.....	[C]	.....	.....	.....	.....	.....
1896	.....	.....	.....	.....	.....	[D], [F]1,450	.....	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	[D], [F]65,975	.....	.....	.....	.....	.....
1898	.....	.....	.....	.....	.....	[F]544,620	.....	.....	.....	.....	.....
1899	.....	.....	.....	.....	.....	[F]668,483	.....	.....	.....	.....	.....
1900	.....	.....	.....	.....	.....	[F]829,560	.....	.....	.....	.....	.....
1901	.....	.....	.....	.....	.....	[F]763,424	.....	.....	.....	.....	.....
1902	.....	.....	.....	.....	.....	[F]571,059	.....	.....	.....	.....	.....
1903	.....	.....	.....	.....	.....	[F]401,817	.....	.....	.....	.....	.....
1904	.....	.....	.....	.....	.....	[F]374,318	.....	.....	.....	.....	.....
1905	.....	.....	.....	.....	.....	[F]311,554	.....	.....	.....	.....	.....
1906	.....	.....	.....	.....	.....	[F]332,622	.....	.....	.....	.....	.....
1907	.....	.....	.....	.....	.....	[F]226,311	.....	.....	.....	.....	.....
1908	.....	.....	.....	.....	.....	[F]211,117	.....	.....	.....	.....	.....
1909	.....	.....	.....	.....	.....	[F]180,764	.....	.....	.....	.....	.....
1909	.....	.....	.....	.....	.....	[F]137,331	.....	.....	.....	.....	.....
1911	.....	.....	.....	.....	.....	[F]128,526	.....	.....	.....	.....	.....
1912	.....	.....	.....	.....	.....	[F]233,282	.....	.....	.....	.....	.....
1913	.....	.....	.....	.....	.....	[F]158,830	.....	.....	.....	.....	.....
1914	.....	.....	.....	.....	.....	[F]133,811	.....	.....	.....	.....	.....
1915	.....	.....	.....	.....	.....	[F]143,275	.....	.....	.....	.....	.....
1916	[C]	.....	.....	.....	.....	[F]135,263	.....	.....	.....	.....	.....
1917	[C]	.....	.....	.....	.....	[F]131,828	.....	.....	.....	.....	.....
1918	[C]	.....	.....	.....	.....	[F]117,577	.....	.....	.....	.....	.....
1919	.....	.....	.....	.....	.....	[K]	.....	.....	.....	.....	.....
1920	.....	.....	.....	.....	.....	[K]	.....	.....	.....	.....	.....
1921	.....	.....	.....	.....	.....	[K]	[M]8,905	.....	.....	.....	.....
1922	.....	.....	.....	.....	.....	[K]	[M]2,005,012	.....	.....	.....	.....
1923	.....	.....	.....	.....	.....	[K]	[M]1,741,774	.....	.....	.....	.....
1924	.....	.....	.....	.....	.....	[K]	[M]981,921	.....	.....	.....	.....
1925	.....	.....	.....	.....	.....	[K]	[M]470,717	.....	.....	.....	.....
1926	.....	.....	.....	.....	.....	[K]	[M]335,098	.....	.....	.....	.....
1927	.....	14,760	.....	.....	86,285	[K]	[M]249,048	.....	.....	.....	.....
1928	.....	325,744	.....	.....	147,449	[K]	196,204	.....	.....	.....	.....
1929	.....	1,132,130	.....	.....	40,832	[K]	158,430	.....	.....	.....	.....
1930	.....	1,153,359	.....	.....	17,799	215,000	125,936	27,220	.....	.....	.....
1931	.....	622,704	.....	.....	5,432	[K]	90,758	[F]109,561,000	.....	.....	.....
1932	.....	370,256	.....	.....	.....	100,000	65,466	[F]121,449,000	.....	.....	.....
1933	.....	278,760	.....	.....	.....	144,000	52,810	[F]204,954,000	.....	.....	5,811
1934	.....	217,882	.....	604,142	.....	149,129	55,640	[F]181,540,000	.....	.....	41,565
1935	.....	203,378	131,360	1,333,864	.....	146,000	49,392	[F]176,859,000	.....	.....	86,103
1936	.....	188,000	136,000	2,187,000	.....	148,000	44,000	[F]167,512,000	.....	.....	405,000
1937	.....	149,000	27,000	3,131,000	.....	147,000	44,000	170,498,000	3,000	4,000	568,000
Total	.....	4,655,973	294,360	7,256,006	297,797	7,851,926	6,675,111	1,132,400,220	3,000	4,000	1,106,479

See footnotes page 66



YOU CAN'T DETERMINE the real quality of steel castings, either, from outside appearance alone. It's the inside that counts most. We invite the investigation of the few who are not yet familiar with the definite advantages of TESCO Steel.

TEXAS ELECTRIC STEEL CASTING CO.

GOOD CASTINGS — TESCO — HOUSTON, TEXAS

Tesco Steel is good Steel!

Tex district so far has been divided as follows:

District	All-time production (Barrels)
Eastern Texas....	1,547,977,297
North Louisiana..	442,685,650
Arkansas	441,803,550
Total	2,432,466,497
United States..	19,972,088,776
Percent of U. S.	12.2

Eastern Texas Fields

Of the total all-time production in Eastern Texas, the East Texas field has accounted for 1,132,400,220 barrels. But that district also embraces several other fields with heavy cumulative production. Powell, Navarro County, has yielded, through 1937, a total of 117,759,937 barrels. Although discovered as recently as 1929, Van field, Van Zandt County, had produced 110,933,270 barrels up to the beginning of this year. Mexia, first of the Woodbine sand fields, has to its credit 95,264,564 barrels.

Eastern Texas has the distinction of having yielded the first oil production in Texas. That production was in the Nacogdoches field, about 1865, or only a few years after the drilling of the Drake well in Pennsylvania, first oil well in the United States. But the Nacogdoches production was not of commercial importance, and the first commercial development in Eastern Texas was at Corsicana in 1896.

The district did not emerge, however, to a "place in the sun" until the discovery of oil in the Woodbine sand at Mexia in 1921.

Mexia was the forerunner of several other important Woodbine sand fields along the Balcones fault zone, and finally the Woodbine was found productive east of the fault line fields in the East Texas basin, at Boggy Creek, Van, and other structures, and across the basin,

East and East Central Texas Crude Oil Production, by Fields, by Years *(Continued)*

YEAR	Lott Falls County	Marion County (West Edge Caddo Field)	Mexia Limestone County	[B]Nacogdoches County	Nigger Creek Limestone County	North Currie Navarro County	Opelika Henderson County	Percella Houston County	Post Oak Falls County	Powell Navarro County	Richland Navarro County	Rodessa Cass County	Rusk Cherokee County
1887	.....	.....	.....	[C]	.....	.....	.....	.....	.....	.....	.....	.....	.....
1888	.....	.....	.....	[C]	.....	.....	.....	.....	.....	.....	.....	.....	.....
1894	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1896	.....	.....	.....	[D]	.....	.....	.....	.....	.....	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1898	.....	.....	.....	[E]1,450	.....	.....	.....	.....	.....	.....	.....	.....	.....
1899	.....	.....	.....	[E]530	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900	.....	.....	.....	.....	.....	.....	.....	.....	.....	[G], [F]6,479	.....	.....	.....
1901	.....	.....	.....	.....	.....	.....	.....	.....	.....	[G], [F]37,121	.....	.....	.....
1902	.....	.....	.....	[C]	.....	.....	.....	.....	.....	[F]46,812	.....	.....	.....
1903	.....	.....	.....	[C]	.....	.....	.....	.....	.....	[F]100,143	.....	.....	.....
1904	.....	.....	.....	[C]	.....	.....	.....	.....	.....	[F]129,329	.....	.....	.....
1905	.....	.....	.....	.....	.....	.....	.....	.....	.....	[F]132,866	.....	.....	.....
1906	.....	.....	.....	.....	.....	.....	.....	.....	.....	[F]673,221	.....	.....	.....
1907	.....	.....	.....	.....	.....	.....	.....	.....	.....	[F]596,897	.....	.....	.....
1908	.....	.....	.....	.....	.....	.....	.....	.....	.....	[F]421,659	.....	.....	.....
1909	.....	.....	.....	.....	.....	.....	.....	.....	.....	[F]383,137	.....	.....	.....
1910	.....	[H], [F]251,717	.....	.....	.....	.....	.....	.....	.....	[F]450,188	.....	.....	.....
1911	.....	[H], [F]677,689	.....	.....	.....	.....	.....	.....	.....	[F]373,055	.....	.....	.....
1912	.....	[F]362,870	.....	.....	.....	.....	.....	.....	.....	[F]251,240	.....	.....	.....
1913	.....	[F]262,392	.....	.....	.....	.....	.....	.....	.....	[F]282,476	.....	.....	.....
1914	.....	[F]180,584	.....	[C]	.....	.....	.....	.....	.....	[F]282,279	.....	.....	.....
1915	.....	[F]123,464	.....	[C]	.....	.....	.....	.....	.....	[F]237,410	.....	.....	.....
1916	.....	[F]64,971	Gas	[C]	.....	.....	.....	.....	.....	[F]215,729	.....	.....	.....
1917	.....	[F]57,952	Gas	.....	.....	.....	.....	.....	.....	[F]196,855	.....	.....	.....
1918	.....	[F]48,041	[C]	.....	.....	.....	.....	.....	.....	[F]195,207	.....	.....	.....
1919	.....	.....	.....	[J]95,000	.....	.....	.....	.....	.....	[K], [F]269,000	.....	.....	.....
1920	.....	.....	[C]	[J]75,000	.....	.....	.....	.....	.....	[K], [F]297,000	.....	.....	.....
1921	.....	.....	[M]5,783,236	[J]103,035	.....	Gas	.....	.....	.....	[K], [J]305,335	.....	.....	.....
1922	.....	.....	[M]33,937,513	[J]58,875	.....	[N]	.....	.....	.....	[K], [J]245,705	.....	.....	.....
1923	.....	.....	[M]18,044,375	[J]39,145	.....	[N]	.....	.....	.....	[K], [M]30,373,335	.....	.....	.....
1924	.....	.....	[M]10,466,567	[J]37,920	.....	[N], [M]77,184	.....	.....	.....	[K], [M]32,935,899	[M]3,341,714	.....	.....
1925	.....	.....	[M]6,700,444	[J]11,746	.....	[M]76,547	.....	.....	.....	[K], [M]17,176,938	[M]1,725,028	.....	.....
1926	.....	.....	[M]4,769,732	.....	[M]1,572,899	[M]82,307	.....	.....	.....	[K], [M]10,022,324	[M]504,782	.....	.....
1927	.....	.....	[M]3,622,385	.....	[M]972,291	[M]41,813	.....	.....	.....	[K], [M] 5,839,114	[M]272,576	.....	.....
1928	.....	.....	2,517,744	.....	221,850	.....	.....	.....	.....	[K]3,949,245	198,537	.....	.....
1929	.....	.....	1,908,247	.....	119,043	.....	.....	.....	.....	[K]2,776,615	131,291	.....	.....
1930	.....	.....	1,529,162	.....	71,721	.....	.....	.....	.....	2,026,017	72,130	.....	.....
1931	.....	.....	1,156,386	.....	26,871	.....	.....	.....	.....	[K]1,257,577	27,176	.....	.....
1932	.....	.....	935,601	.....	.....	.....	.....	.....	.....	965,244	15,046	.....	.....
1933	.....	.....	835,900	.....	.....	.....	.....	.....	.....	999,624	13,727	.....	.....
1934	.....	.....	789,124	.....	.....	.....	.....	.....	.....	888,262	12,752	.....	42,952
1935	.....	.....	803,148	.....	.....	.....	.....	.....	.....	832,600	11,234	9,710	97,197
1936	.....	.....	765,000	.....	.....	.....	.....	.....	.....	795,000	8,000	3,149,000	66,000
1937	6,000	.....	700,000	.....	.....	.....	1,000	12,000	11,000	793,000	6,000	12,648,000	40,000
Total	6,000	2,029,680	95,264,564	422,701	2,984,675	277,851	1,000	12,000	11,000	117,759,937	6,339,993	15,806,710	246,149

GENERAL NOTE: In addition to figures shown above, the following information is available on the district, being from annual volumes of *Mineral Resources*: About 1867, according to *Mineral Resources* of 1897, the first development of oil in Texas was near Nacogdoches, when oil was found at Oil Springs, about 15 miles south of town. Nearly 100 wells were sunk at that time, and high gravity oil was found at about 100 feet. Also small oil production (no record available) was reported near Palestine, Anderson County, in 1902 and 1907; and on the Prather farm, four miles west of Waco, McLennan County, in 1916 and 1917.

[A] Completed in 1895, Corsicana discovery well ushered in first important oil production in Texas, although Bexar County yielded small quantities earlier.

[B] Nacogdoches had first development in Texas, about 1865.

[C] Small production, but no record available.

[D] Corsicana figure for 1896 includes small production of Bexar County, Nacogdoches, and Sour Lake; that for 1897 includes only Bexar County and Sour Lake.

[E] Nacogdoches in 1898 and 1899 includes Bexar County and Sour Lake.

[F] From annual volumes of *Mineral Resources* and *Minerals Yearbook*.

[G] Powell in 1900 and 1901 includes small production in Bexar County; at Sour Lake; near Lockhart, Caldwell County; and in Bastrop County.

[H] *Mineral Resources* indicated Marion County in 1910 and 1911 represented Potters Point.

[I] The East Texas field embraces portions of five counties, as follows: Rusk, Gregg, Upshur, Smith, and Cherokee.

[J] Based on figures compiled weekly by THE OIL WEEKLY; the yearly figures having been published originally in annual statistical issues.

[K] Corsicana included with Powell.

[M] From *Structure of Typical American Oil Fields*, Volume 1.

[N] North Currie Production in 1922 and 1923 included with that shown for 1924.

in the East Texas field, where that sand pinches out along a buried shore line.

In recent years, production has been established also in additional pay zones, as in the Paluxy at Talco and the Trinity at Rodessa.

North Louisiana Fields

North Louisiana's first recorded oil production was that at Caddo Lake in 1906, and Caddo Parish continued the only producing area until 1914. The Caddo field has accounted for the greater part of the 145,616,886 barrels of cumulative production accredited to Caddo Parish, and it ranks as the leader among the fields of the district in past performance. Next in rank are Haynesville, Claiborne Parish, with all-time production of 66,411,800 barrels, beginning in 1921; and Homer, same parish, which has produced 65,893,850 barrels since discovery in 1919. Although Rodessa (in Louisiana) ultimately will be among the top-ranking fields of North Louisiana in cumulative production, its output through 1937 had reached 38,193,750 barrels, including 1,364,000 barrels in 1935, 19,003,750 barrels in 1936, and 17,826,000 barrels in 1937.

Arkansas Fields

Arkansas entered the list of oil producing states in 1921 through discovery of the El Dorado pool, and by virtue of over 10,000,000 barrels output in that field in 1921, Arkansas achieved the distinction of having produced more oil during its first year than any other state. In the 17 years since its discovery, El Dorado has produced (through 1937) 53,876,000 barrels of oil, the most for any field in the state except one.

By far the greatest field output in Arkansas has been that of Smackover, which rates, moreover, among a comparatively few of the most prolific fields of the United States. Smackover has produced more than one third of a billion barrels of oil, in a period of 16 years. It was opened soon following the finding of gas, through a well that came in during April, 1922, and blew out a crater 450 feet in diameter and 50 feet deep.

The first oil well at Smackover was completed on July 31, 1922, and by the end of the year the field was producing over 90,000 barrels daily. Many of the early wells produced initially from 5000 to 10,000 barrels a day, and some ranged in initial production up to 30,000 barrels daily. By the summer of 1923 the Smackover production had risen to about 125,000 barrels daily. In early summer, 1924, the field's production had increased further to about 150,000 barrels a day.

East and East Central Texas Crude Production, by Fields, by Years—(Continued)

YEAR	Shelbyville Shelby County	South Bosque McLennan County	Sulphur Bluff Hopkins County	Tacoma Panola County	Talco Titus-Franklin Counties	Van Field Van Zandt County	Wortham Freestone-Limestone Counties	Unclassified	Total East and East Central Texas
1887									c
1888									c
1889–1894									
1895									c
1896									1,450
1897									65,975
1898									546,070
1899									669,013
1900									836,039
1901									800,545
1902		c							617,871
1903									501,960
1904		c							503,647
1905		c							444,420
1906		c							1,005,843
1907		c							823,208
1908		c							632,776
1909		c							563,901
1910		c							834,236
1911		c							1,179,270
1912		c							847,392
1913		c							703,698
1914		c							596,674
1915		c							504,149
1916							Gas		415,963
1917	c								386,635
1918	c								360,825
1919									364,000
1920									372,000
1921									6,200,511
1922									36,247,105
1923									50,198,629
1924							[M]888,856		48,730,061
1925							[M]15,946,673		42,108,093
1926							[M]2,801 123		20,088,265
1927							[M]1,134,231		12,232,503
1928							647,472		8,204,245
1929						250,068	410,810		6,927,466
1930						7,693,956	287,825		13,220,125
1931						15,670,961	126,609		128,545,474
1932						17,322,795	51,864		141,275,272
1933						17,242,324	44,747		224,571,703
1934				5,516		14,725,793	38,414		199,111,081
1935				3,080		14,165,463	35,675		194,767,204
1936			73,000	3,000	1,387,000	12,527,000	30,000		189,423,000
1937			1,605,000	7,000	9,778,000	11,335,000	31,000		211,544,000
Total			1,678,000	18,596	11,165,000	110,933,270	22,475,299		1,547,977,297

See footnotes page 66

HISTORY OF

Arkansas

Discoveries of new producing formations indicate that record of two major fields among 16 found in 17 years is to be surpassed in the future

By GRADY TRIPLETT
Staff Writer

Here is the Mitchell & Busey well cleaning itself and announcing the first commercial oil in Arkansas. Back in 1921 letting a well flow wild was good completion practice and letting a well flow at capacity was good production practice. This discovery well in the El Dorado pool was plugged in April after being completed in January.

OIL history in Arkansas fits into that brief period between 1921 and 1938, 17 years in which the state has come to have 16 oil fields, which cover 49,090 acres, which have 2663 producing wells, which have daily production of 47,191 barrels and cumulative output of 447,789,758. Arkansas occupies but a small spot on the oil screen of the United States but its part of the screen is brilliant.

Its outstanding oil fields are El Dorado, discovered in 1920 and Smackover, discovered in 1922. Now the Schuler field is moving into position to indicate that it will rank with these two in brilliance, while one well at Buckner holds promise of still another ranking field.

First Oil in 1921

Before there was commercial oil in Arkansas the S. S. Hunter well, No. 1 Lester & Haltom, Section 13-15-19, Ouachita County, was completed

16 Months Continuous Service with HYPER

AND NOT A SINGLE CHAIN BREAK!

● 17,900 feet of hole under normal drilling conditions would not be unusual service for Link-Belt 3-Bar HYPER Chain . . . but this amount of footage in hard rock formation is a different story. Throw in two difficult fishing jobs, which prolonged the total period of continuous service to 16 months, and you have exceptional ton-mileage.

This is the record of Link-Belt SS-124 3-Bar HYPER Chain (170,000 pounds ultimate breaking strength) on this Washington County, Texas, wildcat development, including an 8,400 foot hole, a 5,500 foot hole, and now drilling ahead near 4,000 feet on the job pictured here.

During this period of 16 months continuous service *there has not been a single chain break.*

This is just another instance of the unusually satisfactory performance of Link-Belt Oil Country Chains.

In addition to rotary drilling chains, Link-Belt oil country products include: Rotary Mud Vibrating Screens, Silent Chain Drives, Roller Chain Drives, Flexible Couplings, Speed Reducers, Pillow Blocks, Clutches, Take-ups, Collars, and other products.

Link-Belt Company, Indianapolis, Chicago, Philadelphia, Los Angeles, New York, Houston, Dallas or Tulsa. 7.85

LINK-BELT *Rotary* CHAINS

in the Nacatoch sand at 2124 feet. It was a strike that drew attention, which shortly subsided. Next the gas well of the Constantin Refining Company Hill 1, 12-17-16, Union County, came in for immense gas output at 2243 feet, and cratered.

Finally the Mitchell & Busey well, Armstrong 1, Section 31-17-15, Union County, was completed January 10, 1921, for an estimated gas yield of from 15,000,000 to 35,000,000 cubic feet of gas and from 3000 to 10,000 barrels of oil from the Nacatoch sand, 2226 to 2242 feet. Inability to complete the well properly plus its high pressure resulted in abandonment by April of that year, but development of the El Dorado pool was well under way by this time.

The East El Dorado field was discovered the next year also from the Nacatoch sand.

Smackover the Largest

It was Smackover, however, which put Arkansas high in the oil producing column. Its first well, Oil Operators Trust, Murphy 1, 8-16-15, blew in April 14, 1922, and cratered. Then V. K. F. Oil Company drilled the first commercial well at Smackover, Richardson 1, 1-29-15, Union County, July 23, 1922, from the Nacatoch sand 2232 to 2246 feet, initial production 300 barrels.

Later the Graves sand (identical with the Blossom of North Louisiana) was found productive at 2501 feet. Out of these strikes came the development of the Norphlet and Louann districts in Union and Ouachita counties, which finally spread over 29,500 acres with four sands producing over all or parts of this area.

New Formations Found

It has contributed 343,000,000 barrels of the grand total of Arkansas oil production. Following Smackover came discovery of most of the smaller oil fields in Arkansas and one of these, Snow Hill, a small spot near Smackover, Union County, established the Permian beds as productive of oil.

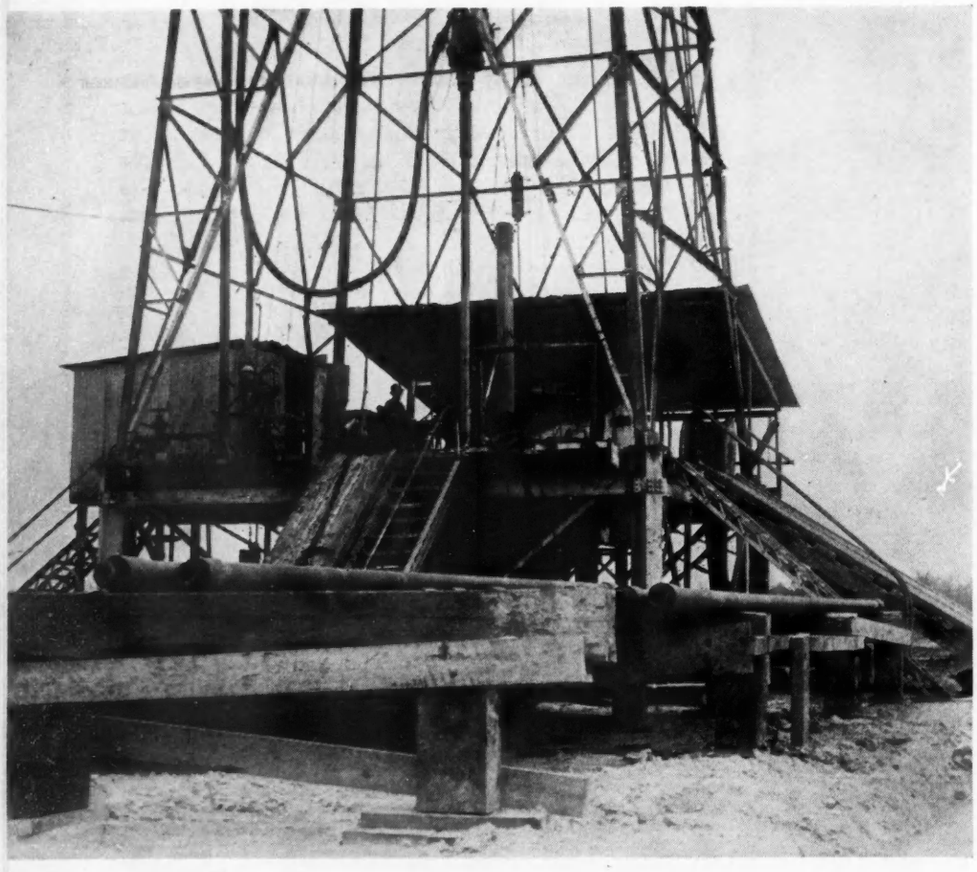
Phillips Petroleum Company completed Reynolds 1, SE SE SW 27-15-15, in the Reynolds lime, April 28, 1936, 4900 feet. Snow Hill has but six producing wells and produces but 120 barrels daily.

Schuler to Foreground

April 5, 1937, marked discovery of the Schuler field, Union County, as Lion Oil Refining Company completed Edna Morgan 1, 18-18-17, for 300 barrels from the Morgan zone, 5537-59 feet for 300 barrels.

Next Edwin M. Jones drilled Marine 1, NW SW SE 7-18-17 to the Morgan zone and found poor saturation. The hole then was carried to 7553 feet and responded with a flow of 2500 barrels. The sand, Lower Marine, is known locally as the Jones sand and has not been correlated with the sand producing in any other field.

When the first Morgan Zone producer ceased to flow, it was drilled to the Jones sand, where saturation was not satisfactory and the decision for a still deeper test followed. In the Reynolds lime (Permian which had been productive at Snow Hill) saturation was found at 7579 feet and the hole carried to 7616 feet. High gas yield and distillate of 68 gravity were found. The field now has two of these Permian producers.



Modern drilling requirements in Arkansas are a far cry from those in existence just a few years ago. Massive equipment is needed to reach the new and deeper formations that have been found. This rig is seeking Permian production at Schuler, usually found around 7600 feet with pressures exceeding 3000 pounds.

Production from the Permian in two instances gave encouragement to deep drilling in Arkansas and Standard Oil Company of Louisiana, November 30, 1937, completed McKean 1, 8-16-22, Columbia County, in the Permian, total depth 7258 feet, initial output 350 barrels. Buckner has but the one well.

The Rodessa field, a discovery in Louisiana in 1935, was carried into Miller County, Arkansas, in 1937, when W. L. McClanahan completed Capps 1, 11-20-28, June 22. The Arkansas part of Rodessa has 66 producing wells from three sands as well as five gas wells.

On the following pages appear a pictorial story of Schuler, the most important area now being actively developed in the state today. Historical, geological and operating highlights are presented.

JENNINGS CAME BACK

In more ways than One!

The Jennings, La., deep flank sand production of today is a far cry from the original Jennings "gusher" days of 35 years ago when the "pay-off" was from shallow cap rock above the dome.

Orderly operations with modern methods and equipment in the new Jennings development is completing the 7,500-foot wells today in the same time required to complete holes one-fourth this depth in the old field. Too, the hazards of Jennings early-day development are largely eliminated by modern engineering methods and equipment.

The Link-Belt dual vibrating screen hook-up pictured above, on a recent deep Jennings location, is an excellent example of the advanced equipment and methods which make the new Jennings a come-back . . . in more ways than one.

Link-Belt Company, Philadelphia, Chicago, Indianapolis, Los Angeles, New York, Houston, Dallas or Tulsa.

LINK-BELT OIL COUNTRY PRODUCTS INCLUDE:

Rotary Drilling Chains — Rotary Mud Vibrating Screens — Silent Chain Drives — Roller Chain Drives
Flexible Couplings — Speed Reducers — Pillow Blocks — Clutches — Take-ups — Collars

7291

LINK-BELT *Vibrating* SCREEN

Schuler

HISTORY

Oil production at Schuler dates from April 5, 1937, when Lion Oil Refining Company completed Edna Morgan 1, 18-18-15, Union County, for 300 barrels in the Morgan zone (lower Trinity), 5537 to 5559 feet.

Edwin M. Jones, Marine 1, 17-18-17, found the Morgan zone dry and drilled to the Jones sand (lower Marine) 7555 to 7606 for flowing output of 2500 barrels daily.

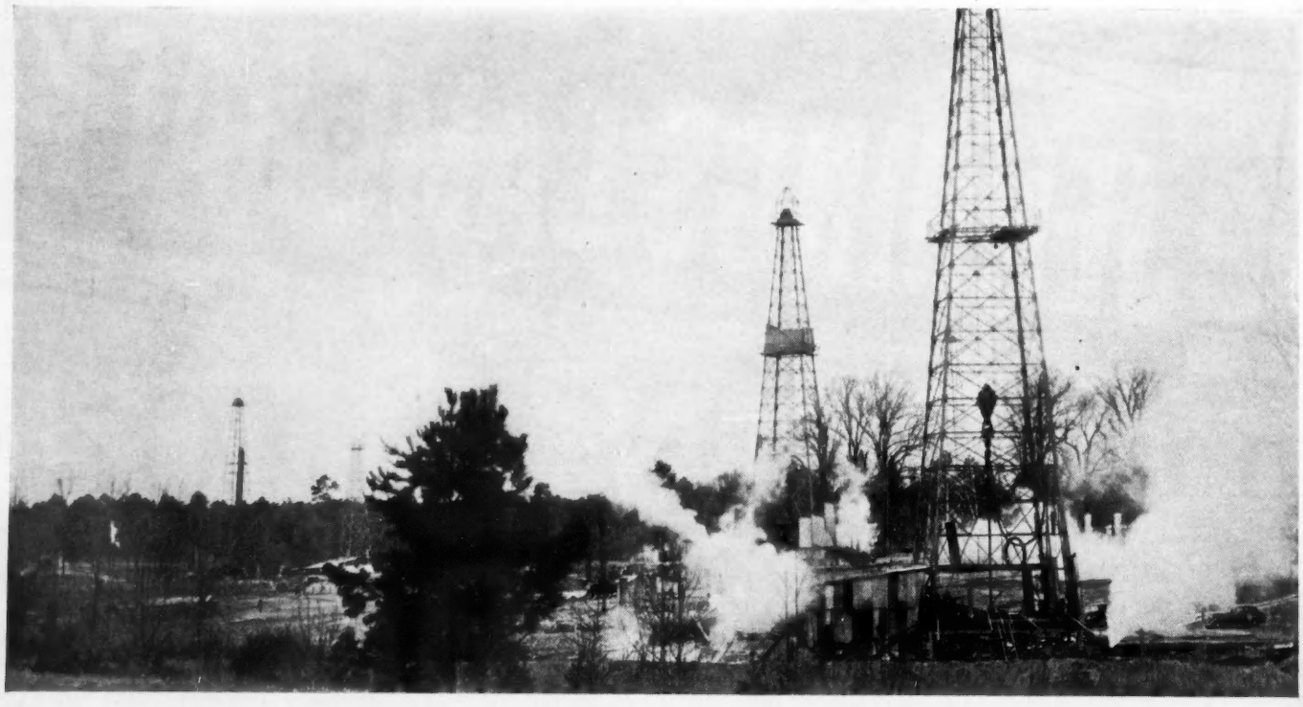
Lion Oil Refining Company then drilled Edna Morgan 1, which had flowed 33,000 barrels of oil, to the Jones sand, top 7498, which failed to produce, then to the Reynolds lime (Permian) 7579 to 7641 feet, where it made both gas and distillate.

Only Jones sand wells are under proration, 800 barrels daily in February. Drilling is on 20-acre spacing.

Bottom-hole pressure of Jones sand wells is from 3200 to 3500 pounds.

Production now covers 700 acres. Estimates of final development are from 5000 to 10,000 acres. Recovery is estimated as high as 10,000 barrels per acre.

There are 32 wells producing and 24 drilling.



GEOLOGY

The structure is an anticline. Oil accumulation is in three formations.

Morgan sand (basal Trinity) is found between 5500 and 5600 feet. It is not uniform.

The Jones sand (lower Marine) has not been identified with any other production in the area. It is found between 7500 and 7600 feet and has average saturation of 60 feet.

The Reynolds (Permian) lime, deepest Schuler production, is identical with lime production at Snow Hill. At Schuler it has one producing well, making gas and distillate of 68 gravity.

.with REED BITS

ALL

REED DK

ROCK BITS

EXCEPT ONE

WERE USED THROUGH SAND
PYRITE - SHALE - LIME - SAND
ROCK AND SANDY LIME

from

2400 FEET

to

5182 FEET

When the contract called for a hole not over 1° off vertical in the notoriously hard formation at Barber's Hill, Texas

REED ROCK BITS

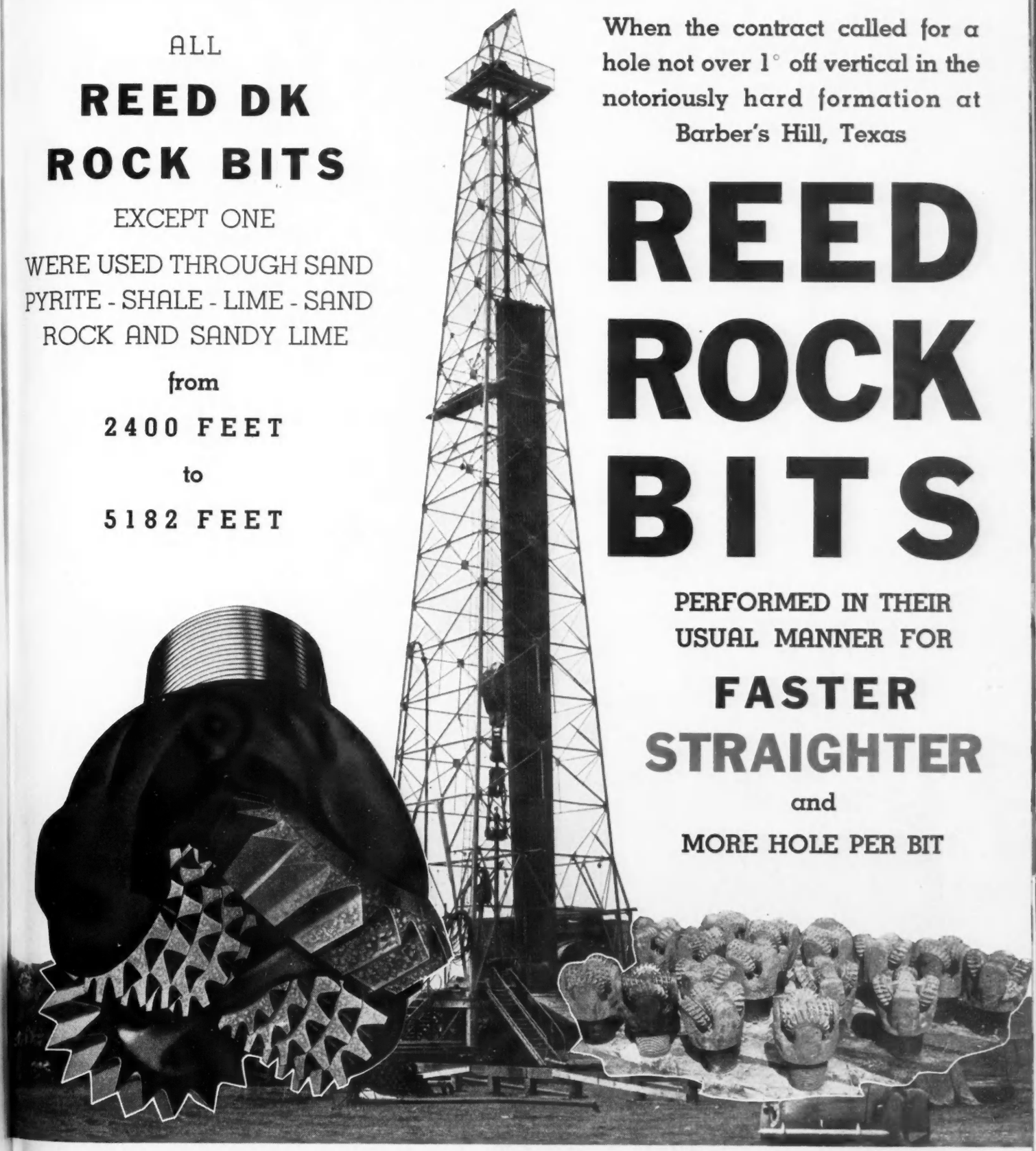
PERFORMED IN THEIR USUAL MANNER FOR

FASTER

STRAIGHTER

and

MORE HOLE PER BIT



TRAVERSO NO. 1 — O. W. DYER, CONTRACTOR

BIT COMPANY

[Schuler Continued]

DRILLING

Rigs capable of drilling to 10,000 feet are required for Jones sand drilling at Schuler.

Derricks 136 feet high predominate.

All rigs are steam powered with three-boiler hookups. The field has ample soft water from wells 400 feet deep.

One engine, usually 12 x 12, provides power for drilling and hoisting.

Two slush pumps are required for circulation and standby equipment.

Mud made up in the field is used to start the holes. Prior to setting casing, commercial muds are added to bring the weight to 10 or 11 pounds and to provide a slick fluid for casing.

Drilling time is from 60 to 70 days. Wells cost $85,000 to the Jones sand, which includes flow assembly, separator and tanks.

Drag bits are used for the hole until surface pipe is set, usually around 2000 feet. The remainder of the hole is made with hard formation bits, 40 to 50 being required for a well.

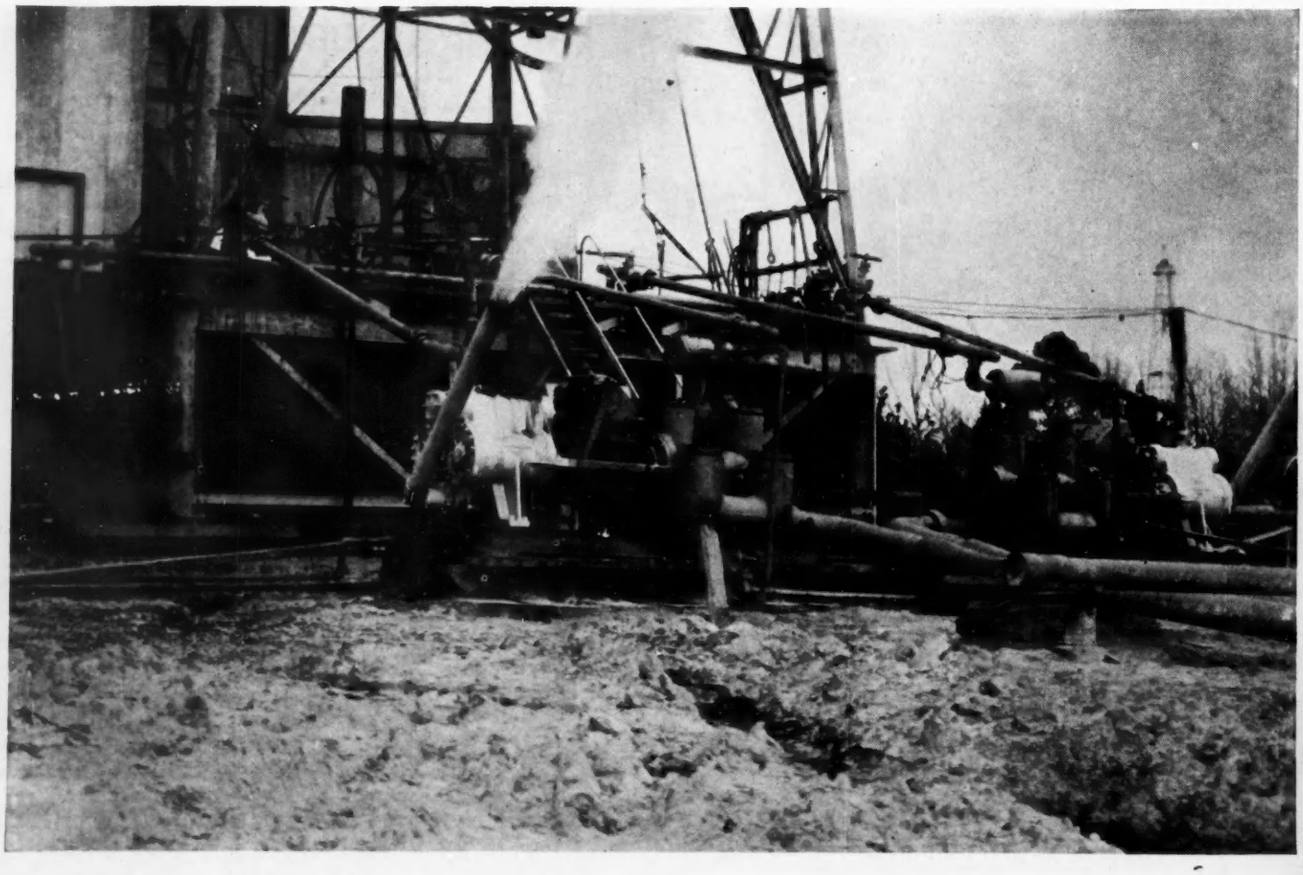
CASING

The first pipe string is 100 to 200 feet of 16½-inch casing, used in part as a conductor to assist in getting a straight hole. It is cemented to the surface.

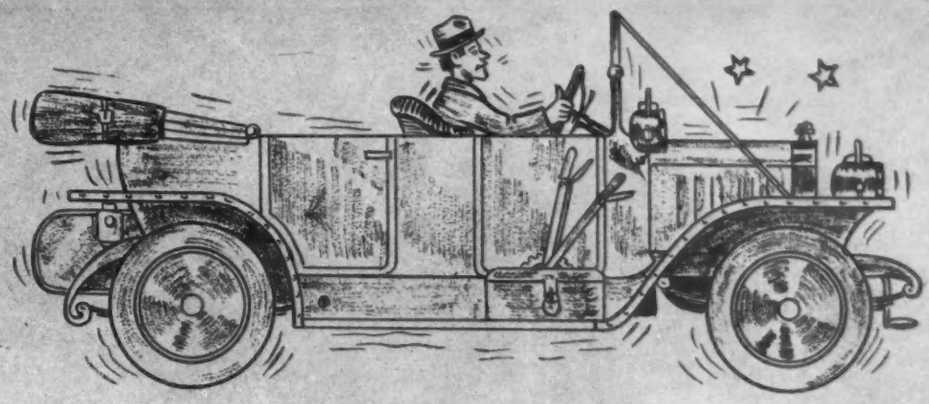
The surface string is set over a range from 1800 to 2400 feet, depending on formations. Cement requirement for this string is from 1000 to 1500 sacks. Most surface pipe is 10¾ inch.

The producing string is 7 inch, which is cemented through the saturated section and gun perforated after setting cement back to the bottom of the surface string.

All wells are tubed with 2½-inch tubing. This is hung in the hole with the bottom joint perforated.



LOPY"
Industry



LIKE THE "JALLOPY" OF OLD . . . the Standard Rig was a good "job" in its day. But no one would buy and use an outmoded "Jallopy" in preference to the modern, efficient, stream-lined automobile of this age.

The same is true of pumping equipment. Wherever the "Jallopy of Oil Well Equipment" (the old Standard Rig) is in use, it is being rapidly replaced by the "Rolls Royce" of gear reduction units . . . efficient, trouble-free, LUFKIN units.

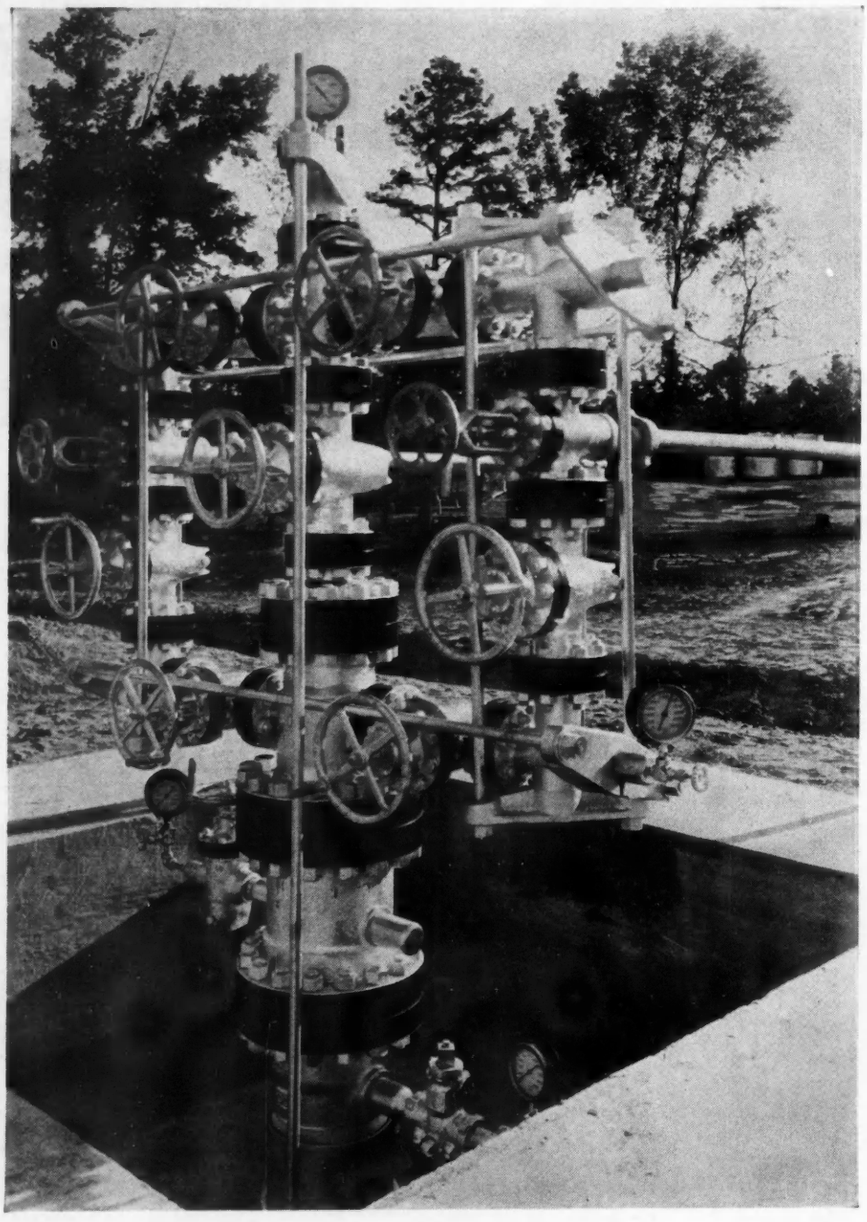
And, believe it or not, like the stream-lined automobile in comparison with the old "Jallopy," the cost to install is less for the compact, efficient, LUFKIN unit as against the cost of the old Standard Rig.

A modern installation of LUFKIN Universal Herringbone Gear Pumping Unit Assembly on the lease of a major oil company.

UNITS

LUFKIN UNITS are manufactured in Lufkin, Texas, by the Lufkin Foundry & Machine Company. Branches in principal oil centers

[Schuler Continued]



FLOWING

Well head assemblies for Jones sand wells at Schuler are built to withstand 10,000 pounds pressure in the shop.

The formation has bottom-hole pressure from 3200 to 3500 pounds. Dual flow line units are universal for wells in this sand, the primary objective in Schuler development.

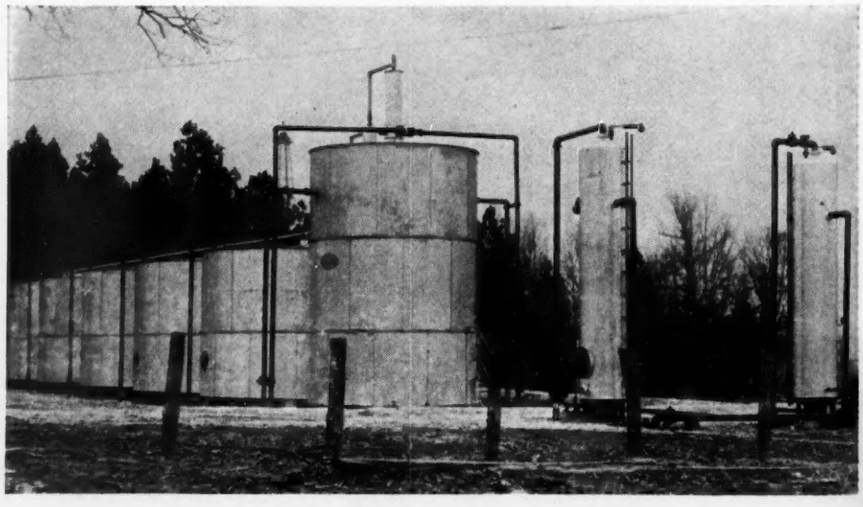
Typical flowing condition under daily allowable of 700 barrels is a casing pressure of 2600 pounds and tubing pressure of 2200 pounds.

Morgan zone wells, during flowing life, are equipped with lighter Christmas trees, 6000 pounds maximum test, with single flow lines. These wells have no output restrictions and flow from 200 to 500 barrels daily when completed.

TANKAGE

Batteries for handling all production on a lease are favorite installations at Schuler. These have from 8 to 12 tanks and 2 separators.

Some batteries now under construction will be equipped with elaborate manifolds.



a money-making product . .

SEE IF KOPPERS MAKES IT

WHEN OIL REFINERIES "CRACK" OILS to make gasoline, fixed gases are given off. Most of these refinery still gases (as well as some natural gases) contain large quantities of hydrogen sulfide.

Now hydrogen sulfide is a valuable commodity . . . but *not* when it is in gases which are to be utilized commercially.

If the gas is to be further processed, hydrogen sulfide may have an injurious effect upon the process and equipment. If the gas is to be used for heating, the hydrogen sulfide may cause objectionable odors.

One valuable thing which can be obtained from hydrogen sulfide is sulfuric acid. The oil refineries which produce the refinery still gas use large quantities of sulfuric acid in their oil refining processes.

They were in the peculiar position of having to buy sulfuric acid from others . . . and at the same time they burned hydrogen sulfide from which sulfuric acid could be obtained.

This problem was brought to the Koppers engineers because they have had the broadest experience in the purification of gases.

To solve it, the Koppers engineers developed a completely new method of purification, called the Phenolate Process.

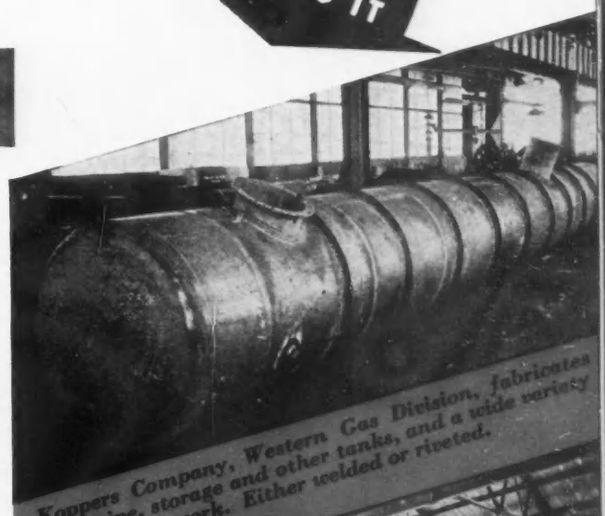
It requires only a small, compact plant. It removes from 95% to 99.8% of the hydrogen sulfide. It recovers it in a form which is most readily converted into sulfuric acid. It is inexpensive to build. It is easily maintained. It pays for itself very quickly.

• • •

Perhaps you will never be in a position where you would want to buy a phenolate plant . . . but there is a valuable lesson for you in the story of the Phenolate Process.

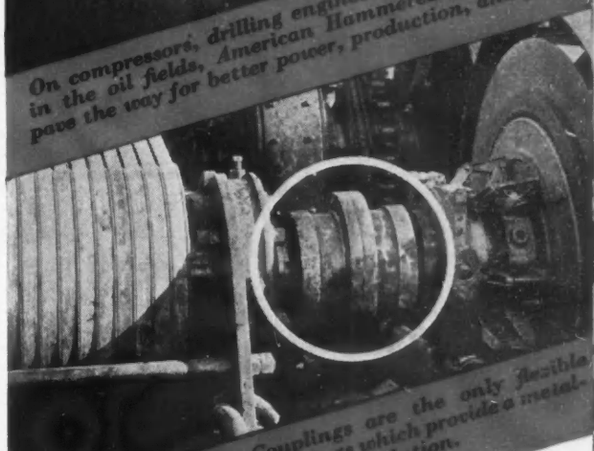
Again and again, Koppers engineers have done some trail-blazing job like this. Perhaps they may be able to do some trail-blazing on a problem that confronts your company. May we have an opportunity of discussing it?

KOPPERS COMPANY . . . PITTSBURGH

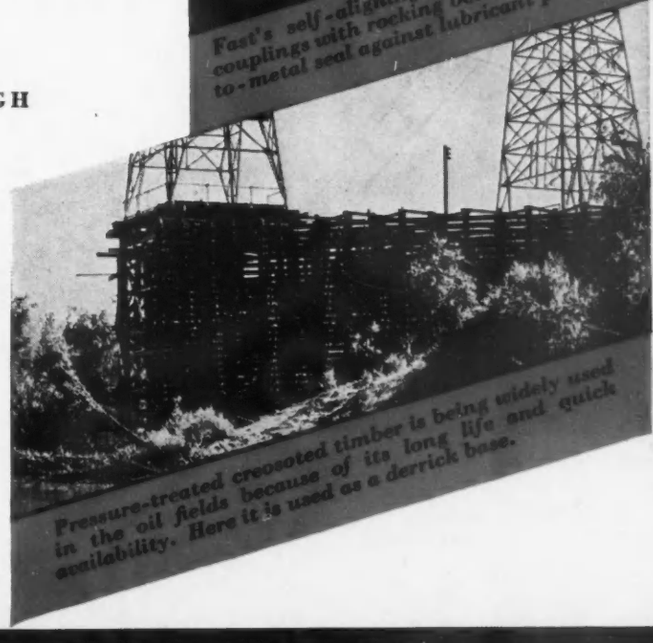


Koppers Company, Western Gas Division, fabricates large pipe, storage and other tanks, and a wide variety of steel plate work. Either welded or riveted.

On compressors, drilling engines and other machines in the oil fields, American Hammered Piston Rings pave the way for better power, production, and profit.



Fast's self-aligning Couplings are the only flexible couplings with rocking bearings which provide a metal-to-metal seal against lubricant pollution.

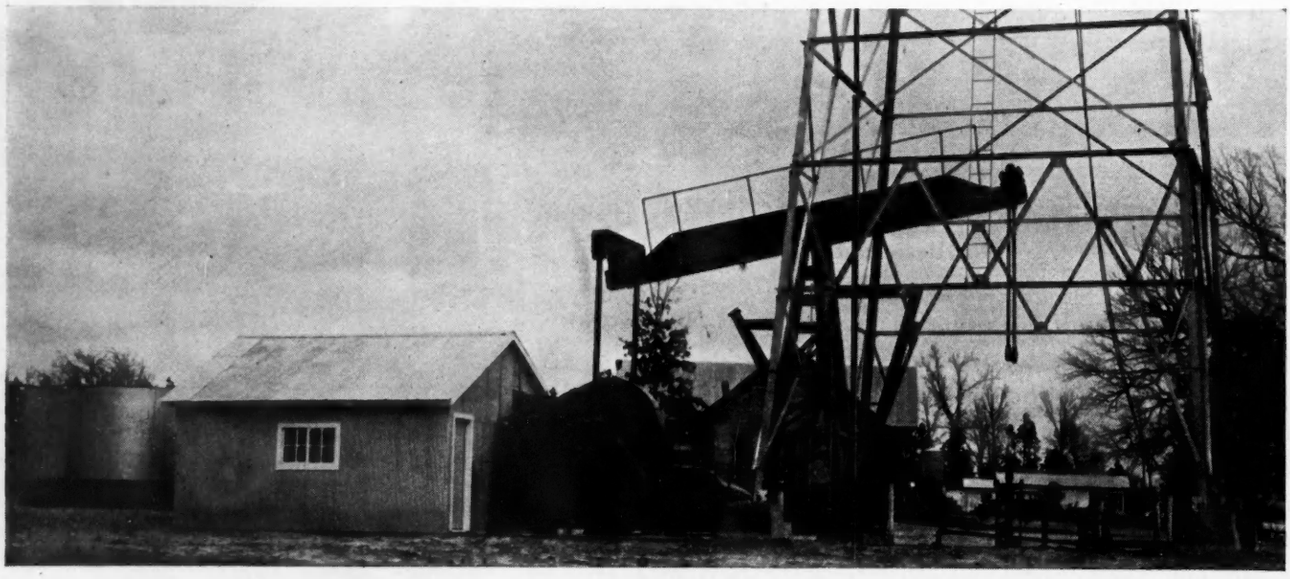


Pressure-treated creosoted timber is being widely used in the oil fields because of its long life and quick availability. Here it is used as a derrick base.

KOPPERS DIVISIONS, SUBSIDIARIES AND AFFILIATES

[illegible] Hammered Piston Ring Division · Bartlett Hayward Division · [illegible] Boat Company · Eastern Gas and Fuel Associates · Engineering [illegible] Construction Division · Gas and Coke Division · The Koppers Coal [illegible] · Koppers-Rheolaveur Company · The Maryland Drydock [illegible] · Mystic Iron Works · Mystic Steamship Company · National [illegible] Creosoting Company · New England Coal & Coke Company [illegible] Chemical Division · Western Gas Division · The White Tar [illegible] of New Jersey, Inc. · The Wood Preserving Corporation

[Schuler Continued]



PUMPING

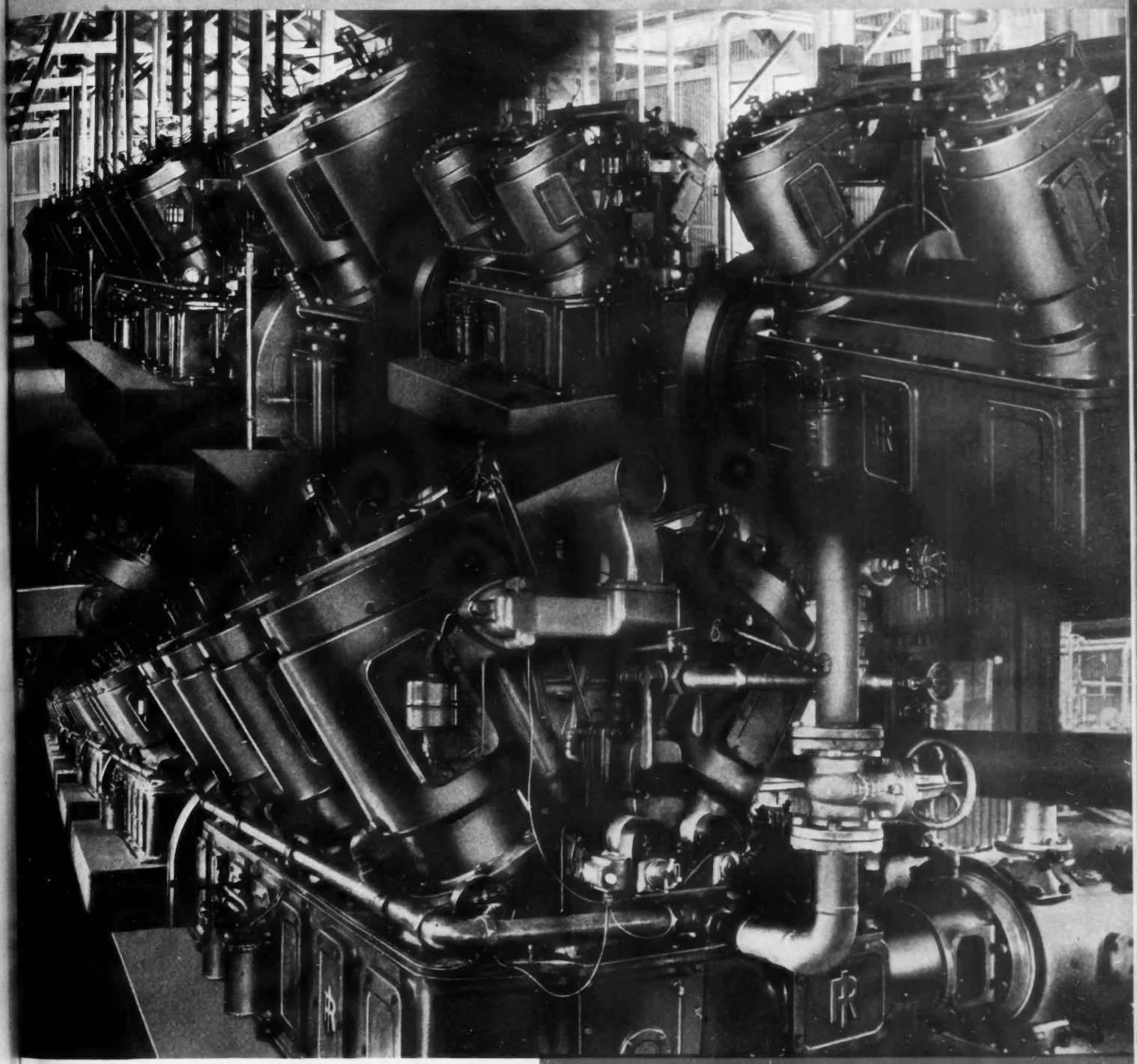
Only Morgan zone wells are pumping at Schuler. Flowing life of this formation is indefinite, which prompts well owners to install pumping units shortly after completion.

Both electric motors and gas engines are used for prime movers. Beam pumping is the only type of equipment.

Oil is lifted 5400 feet. Wells pump from 100 to 300 barrels daily.

Schuler wells are started with the deeper Jones sand as the objective. If the Morgan zone responds, wells are completed there flowing, after which they are pumped or drilled deeper.

ROVES the DEPENDABILITY of XVG COMPRESSORS for REPRESSURING and GAS-LIFTING



balanced, inexpensive to install, easy to operate and simple to maintain. It is available in four sizes of 75, 150, 225 and 300 hp., all using identical engine cylinders and working parts. Catalog No. 3165 gives full details. Ask for your copy today.

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...ngham	Cleveland	Hartford	New York	San Francisco
	Dallas	Houston	Philadelphia	Scranton
	Denver	Kansas City	Picher	Seattle
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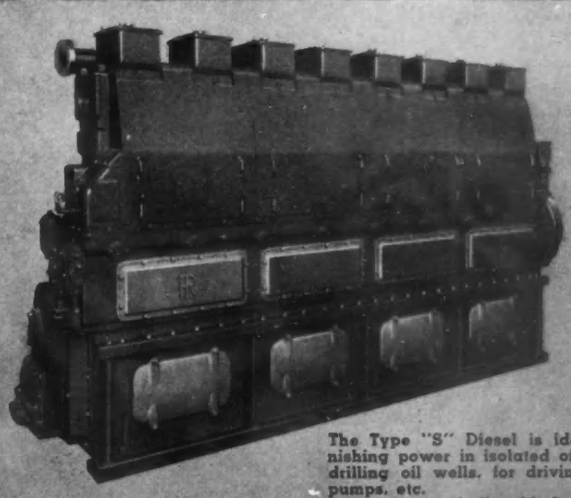
	Duluth	Los Angeles	Pottsville	Tulsa
	El Paso	Newark	Salt Lake City	Washington



The Type "S" Diesel is ideal for furnishing power in isolated oil fields, for drilling oil wells, for driving pipe-line pumps, etc.

Engines are built with 3, 4, 5, 6 and 8 cylinders—ratings from 175 to 460 hp. Ask for your copy of Catalog 1001D today.

Arkansas

Performance Record

Mighty Smackover has accounted for importance of the state in the past, but recent discoveries may make it take a back seat in the near future

By FRANK B. TAYLOR
Staff Writer

DEVELOPMENT of Arkansas as a factor in the petroleum industry has been anything but orderly. In fact, the State has handed many a surprise to both the industry and the individual. And with the finds of last year based upon geophysical work covering areas within which subsurface structural conditions were not indicated by surface geology, it may be that the State is heading into another series of surprises. Schuler, the outstanding 1937 strike in the area, may presage a trend play of considerable magnitude. At any rate, that single strike accounts for more than one half the estimated present discovered unproduced reserve of the entire State. Total estimate for the State —382,825,148 barrels, and for Schuler alone—198,530,000 barrels.

Sixteen fields have been proven in Southern Arkansas, with the mighty Smackover heading the list. Numerous oil shows have been encountered in scattered wildcats, and through lack of outlet what might be commercial production is undeveloped at this time. Of the present listing of pools, the minor areas productive from the regional high in Miller County are considered one field, and three areas are included that at this time have no relative status in the total of known reserves.

The fields cover a total of 49,090 acres in six counties. Smackover accounts for more than one half this total, including a productive area of 26,300 acres. Schuler, although credited with only 700 acres, evidently actually will be productive over a greater area as indicated by subsurface knowledge. El Dorado has been an important factor in Arkansas development, and is now producing from a defined 10,000 acres.

The daily average production is 47,191 barrels from 2663 wells, an average of 17.7 barrels per well. Artificial means of lifting this crude to the surface is employed on more than 2500 of this total as not more than 150 wells are flowing their production. Of natural producers, the majority are located in the Arkansas extension of Rodessa. For more detailed information on this and other outstanding developments see other pages of this issue.

To 1938 the State of Arkansas has produced 447,789,758 barrels of

(*Continued on page 130*)

New Discoveries Should Greatly Improve Arkansas' Performance Record

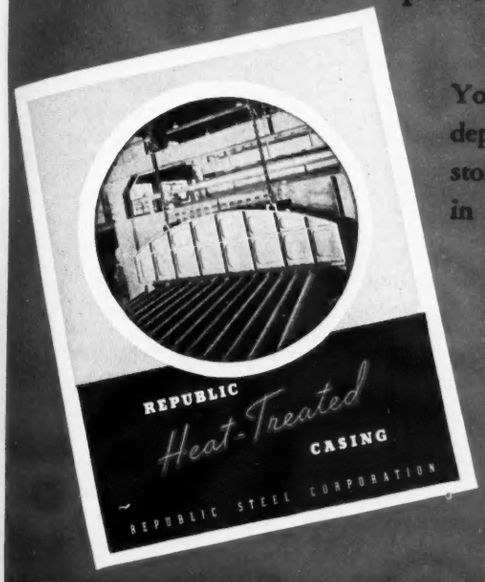
FIELD	Discovery Date	Producing Strata and Depth	Proven Acres	Number of Wells	Daily Production	Cumulative Production	Yield per Acre	Unproduced Known Reserve
Columbia County:								
Buckner	11-30-1937	Permian Lime 7204-58 ft.	.....	1	150	20,026	.....	9,979,974
Stephens	6- 2-1922	Nacatoch 1500 ft.; Blossom (Buckrange) 2300 ft. in 1925	2,800	189	600	5,951,874	2,130	2,228,126
LaFayette County:								
Bradley	12- 1-1925	Blossom (Buckrange) 2750-2800 ft.	300	Abn.	.....	84,200	280	.....
Miller County:								
Garland City	7- 4-1930	Trinity 2800 ft.; Glen Rose 4200 ft. in 1936	720	21	355	1,606,015	2,230	573,985
Rodessa (Extension)	1937	Three sections in Glen Rose 6000-6100 ft.	1,640	64	7,614	1,300,000	795	26,300,000
Nevada County:								
Irma	10-17-1921	Nacatoch 1200 ft.	940	67	255	6,197,106	6,600	1,862,000
Troy	12- 5-1936	Nacatoch 1250 ft.; Tokio 2100 ft.	320	11	1,190	334,261	1,045	2,515,739
Ouachita County:								
Bragg (Camden)	12- 9-1934	Nacatoch 1375 ft.	60	1	7	.....	.....	.....
Mount Holly	4-13-1929	Trinity 2850 ft.	120	....	.....	38,000	325	.....
Smackover	7-23-1922	Nacatoch 2000 ft.; Meakin 2300 ft.; Graves 2400 ft.; Tokio 2600 ft.; Blossom 2800 ft.	26,300	1,740	17,700	349,965,250	13,300	82,034,750
Snow Hill	4-28-1936	Permian Lime 4900 ft.	140	6	200	79,034	565	120,966
Union County:								
Champagnolle (Rainbow)	6-22-1927	Tokio, Woodbine, Crain 2800-3350 ft.	2,200	79	1,200	12,416,600	5,650	15,083,000
El Dorado	1-19-1921	Nacatoch, Tokio, Woodbine, Meakin 2000-3400 ft.	10,000	283	1,865	58,825,550	6,000	39,024,450
Lisbon	12-31-1925	Nacatoch 2100 ft.	2,100	141	255	6,435,291	3,060	1,064,709
Schuler	4- 5-1937	Travis Peak 5550 ft.; Lower Marine 7500 ft.; Permian Lime 7600 ft.	700	28	15,000	1,470,000	2,100	198,530,000
Urbana	1- -1930	Red Beds 3550 ft.; Travis Peak 3600 ft.	750	32	800	4,066,551	5,420	3,508,449
Total	.....	.....	49,090	2,663	47,191	447,789,758	.....	382,825,148

Reg. U. S. Pat. Off.

REPUBLIC STEEL

You can reduce the hazard of casing failure in deep holes. You can set casing at greater depths in lighter weights with no decrease in safety factor. You can increase resistance to collapse without increase in wall thickness. You can do all of these with Republic Alloy Steel *Heat-Treated* Casing.

A special analysis steel plus modern, scientific heat-treatment produces unequaled high compression yield strength with high tensile strength and uniform high ductility. These qualities, plus the uniform wall thickness and perfect roundness made possible only by Republic's exclusive method of pipe-making, provide greater resistance to collapse, to shock and to pull-out.



You'll find deeper suggested setting depths, actual collapse tests and the full story of Republic Heat-Treated Casing in Booklet No. 187. Write for a copy.

REPUBLIC STEEL

BERGER MANUFACTURING DIVISION • STEEL AND TUBES, INC.
UNION DRAWN STEEL DIVISION • TRUSCON STEEL COMPANY
NILES STEEL PRODUCTS DIVISION

HEAT-TREATED CASING

HISTORY OF

North Louisiana

Gas found 100 years ago and was used in 1870, but it remained for deep strikes of past three years to give area outstanding rank and promise

By GRADY TRIPLETT
Staff Writer

DEVELOPMENT by which North Louisiana has come to be a major contributor to the nation's petroleum requirements follows a pattern in that the search for another liquid, water, give the evidence and encouragement which prompted drilling for oil. As in other areas, gas was found while drilling water wells. At first the gas was an obstacle that hampered water provision. Later gas was converted to use. Finally, gas and oil became the primary objective.

This pattern for the upper parishes of Louisiana has its own cut and telling it involves getting back to slavery and plantation days and prior to the dates commonly associated with the history of oil and gas. The pecularity of the case in Louisiana is that, although the record and a makeshift log were left in writing, the dates are indefinite.

Oil development in North Louisiana started on the banks of Caddo lake. It has moved into the lake and around the lake and never deserted the lake. This is the Pine Island section, where in 1936 wells were drilled to the Lower Trinity.

It was between 1821 and 1825 that 15 slaves of the Bermuda plantation on Cane river, Nachitoches Parish, were put to work at a modification of rotary drilling in an effort to provide a plantation water supply. Old Solomon, the biggest negro in all that part of Louisiana, six feet and six inches tall, added the making of tools to his other duties as blacksmith.

A haphazard record of what happened was written by P. Phanor Prudhomme, who kept the plantation commissary. He recorded the development in French and mentioned gas by four such entries in his ledger but failed to give depths and dates.

A round hole was bored, which was squared frequently so a casing of cypress boards could be set and the hole kept from caving.

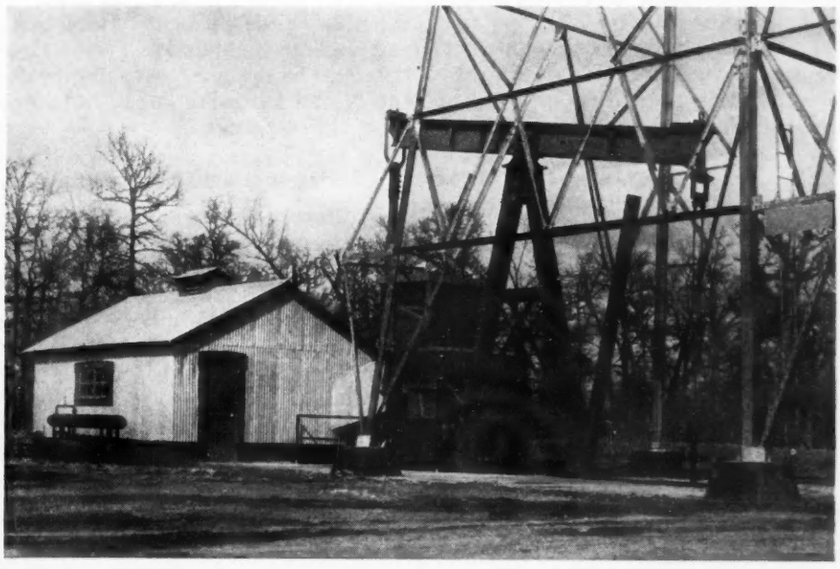
By such tedious process the hole was carried to 400 feet where rock was encountered. This difficulty was too much for the gigantic blacksmith, who could not temper the boring tool to the proper strength for penetrating rock.

Some of the tools have been preserved. The record of the plantation ledger is still available.

Gas Used in 1870

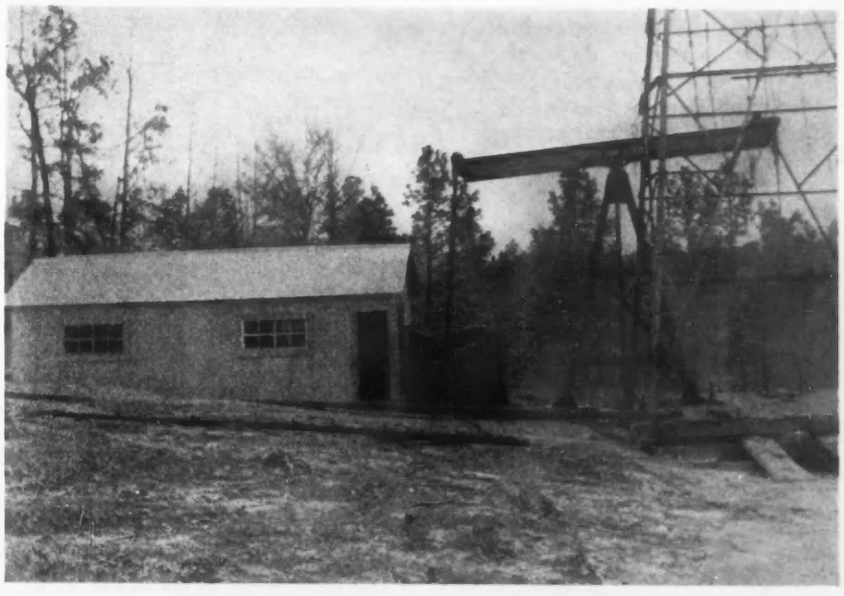
The next record of a water well that encountered gas came in 1870, when slaves had become free men and white men were wrestling with

RIGHT—One of eight Reid Central Pumping Power installations in East Texas which are owned by one company and held in readiness for the day when wells cease to flow.



TYPICAL FRICK-REID INSTALLATIONS IN ARK-LA-TEX

ABOVE—A typical Frick-Reid pumping installation at Talco.



RIGHT—Frick-Reid pumping installation at El Dorado.

Frick-Reid Service knows no limitations. The Driller, the Producer, the Pipe Liner and the Refiner all depend on Frick-Reid.

SUPPLY CORPORATION

Equipment Suppliers Exclusively - Branches in Old and New Fields

an issue known as the period of reconstruction. Civilization had moved along, however, for this water well was being provided for an ice plant in Shreveport. This time men knew what to do with gas, for it became a source of light for the plant and other drilling was done for water.

By such events the stage was set for oil in North Louisiana, and drilling was encouraged by the fact that Spindle Top in 1901 had electrified the world down in Jefferson County, Texas, and Jennings had become a southern Louisiana oil field in 1902. Since there was gas in the northern part of the state, the community question became—why is there no oil here? Stated another way it became—there is oil here.

This was the attitude between the ventures that saw the light rotary rigs of that day moved into Caddo Parish and the Caddo Lake region, where gas seepage was the geological evidence of the day.

First Oil in 1906

The first commercial well of North Louisiana was drilled by the Savage Brothers and associates, who got the hole of Offenhauser 1, Section 1-20n-16w, down to 1556 feet and were rewarded with a daily output of five barrels, March 28, 1906. Incidentally there is no agreement on the date, not even the year of oil discovery in North Louisiana. It happens to be an issue of little importance, but 1906 is accepted here because others have recorded it that way and because the record of oil production for Caddo Parish begins in 1906.

Other drilling followed and four more holes became gas wells. The first substantial oil well was completed by these pioneers August 5, 1907, good for 190 barrels daily flowing. The next year the area got its first pipe line, an invisible hookup between what was taking place in the new oil territory and what was happening in the shop of an erstwhile engineer in Detroit. He had a "silly" idea that an automobile could be built and sold at a price to allow it to become a privilege of the masses.

Early success on the banks of Caddo Lake were such that men were convinced North Louisiana had sufficient crude oil to keep part of those automobiles operating. The result is that the Caddo district, which embraces several fields, now has 60,000 productive acres, much of it in the bed of the lake. It is significant, also, that this Caddo district is now in line for deep testing. Its development so far has been in rocks of Cretaceous age, which is only yesterday to the geologist. Permian rocks have recently been found productive in Louisiana and it is certain that North Louisiana will in time be tested into these deeper beds.

Among its outstanding oil fields are the Red River-Bull Bayou district, discovered in 1912; Homer, discovered in 1919; Haynesville, discovered in 1921; Cotton Valley, shallow oil discovered in 1923 and deep oil discovered in 1935; Rodessa, discovered in 1935; Lisbon, discovered in 1936.

Big Yield at Homer

Homer, on the score of recovery, is the best of the oil fields of North Louisiana, as its two sands, Nacatoch and Blossom, have had recovery of 26,000 barrels per acre. Homer came into the oil picture in the era of high oil prices and made the greater part of its output in the period when oil wells were produced to their limits. Apprices doing nose dives on the New York stock exchange, however, its pearance of water in its first year resulted in quotations of oil share record in output per acre is evidence that a field can make water and still produce a lot of oil.

Haynesville has recovered 12,900 barrels per acre from its one sand, the Blossom, which is the lower of the two sands at Homer.

These two sands of Upper Cretaceous have been established in the North Louisiana area for more than two decades.

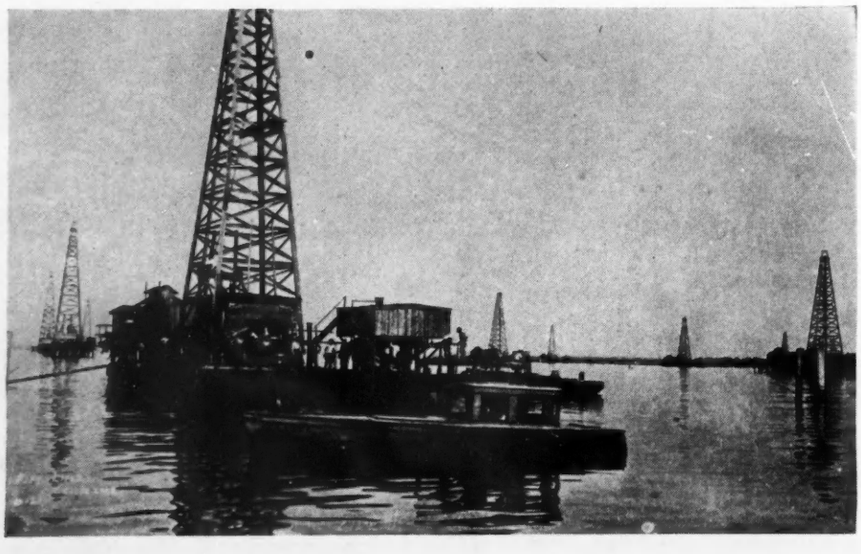
Rodessa Started New Play

Production from beds of Lower Cretaceous age was first established in the Caddo district, but the impetus for this deeper drilling came following the discovery of oil at Rodessa in July, 1935, from the Glen Rose formation within the Upper Trinity group. Rodessa was the major Louisiana strike of 1935. Since then this field has been developed to the southwest into Texas and to the northeast into Arkansas, having three producing members for oil and two for gas.

Deep production at Rodessa set the stage for discovery of the several new fields and deeper formations in 1937. The Lisbon field found production in the basal Glen Rose, the Ben Cross field found production from the Travis Peak, the Ruston field found its production in the Glen Rose, while the Bodcaw sand at Cotton Valley, which yields gas and distillate, is from the Lower Marine.

The deep production at Cotton Valley has carried oil production to near the Permian series of rocks in North Louisiana. Since two fields in Arkansas have Permian production, it is due for testing in Louisiana.

Three fields at present headline development activity in North Louisiana. These are Rodessa, Cotton Valley and Lisbon, each of which is covered in a pictorial story on succeeding pages, in which history, geological and operating data are discussed.



Caddo lake was first in marine development. Here is an early day barge laying a pipe line under water.

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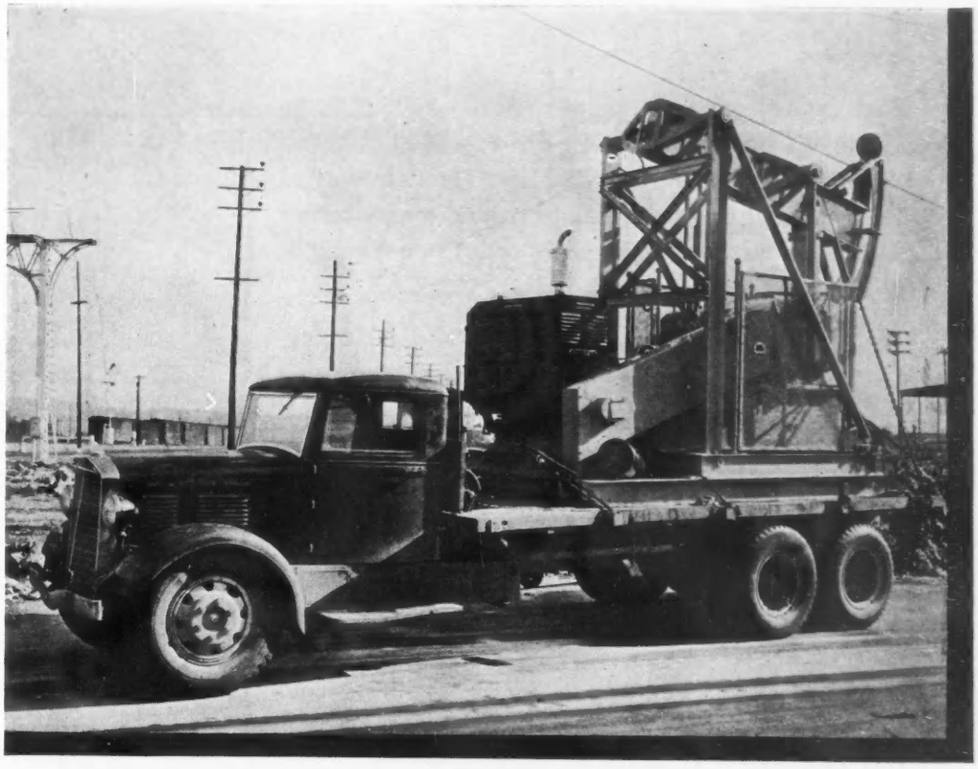

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REED ROLLER BIT COMPANY

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Rodessa

HISTORY

Discovery of gas at Rodessa occurred in 1930 when R. W. Norton completed Hill 1, 33-23-15, Caddo Parish, Louisiana, at 5500 feet. The field had 19 gas wells and took rank as a gas reserve before Union Producing Company completed Young 1, 21-23-16, as an oil well in July, 1935.

The drilling campaign spread into Cass County, Texas, giving the pool a two-state honor. Later discoveries at Lodi and at Jefferson, Marion County, Texas, have yet to be connected with the Cass County extension. The field was extended into Miller County, Arkansas, in 1937.

The field has produced 55,136,000 barrels of oil; Louisiana 38,000,000, Texas 15,836,000, Arkansas, 1,300,000. There are 391 oil wells in Louisiana, 378 in Texas and 62 in Arkansas.

GEOLOGY

The major geological feature of Rodessa is a northeast-southwest fault from the northeast corner of Texas across the northwest corner of Louisiana and into the southwest corner of Arkansas.

The structure is a high along the north, upthrown side of this fault.

Producing formations are within the lower Glen Rose, lower cretaceous. Sand names have been taken from local farm names in some instances. The first is the Hill sand, which carries gas, 10 to 40 feet thick. The Gloyd zone, which yields both oil and gas, is saturated from 80 to 85 feet. The Dees sand, part of the Glen Rose section, is a source of oil with saturated thickness of 15 to 20 feet. Deepest producing formation is the Young sand, which yields oil from an average saturation of 40 feet.

Conservative reserve estimate is 240,000,000 barrels.

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conform strictly to the American Standards. Made from highest quality steel, especially selected for weldability, they are accurately machined and are unexcelled by any other make.

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AREA

Production at Rodessa now covers 22,400 acres; 11,400 in Louisiana, 9200 in Texas and 1640 in Arkansas.

In Louisiana the acreage is 90 percent drilled. Only further drilling can determine the area in Texas. Indications of closure for the southwest end of the pool is indicated from wells completed, leading to the conclusion that Rodessa proper will not extend to the Lodi development in Marion County, Texas. It is also possible that Lodi and the Jefferson development are not connected.

The field should cover 25,000 acres when developed in Arkansas and Texas.

Should drilling link Rodessa, Lodi and Jefferson, the area will be larger.

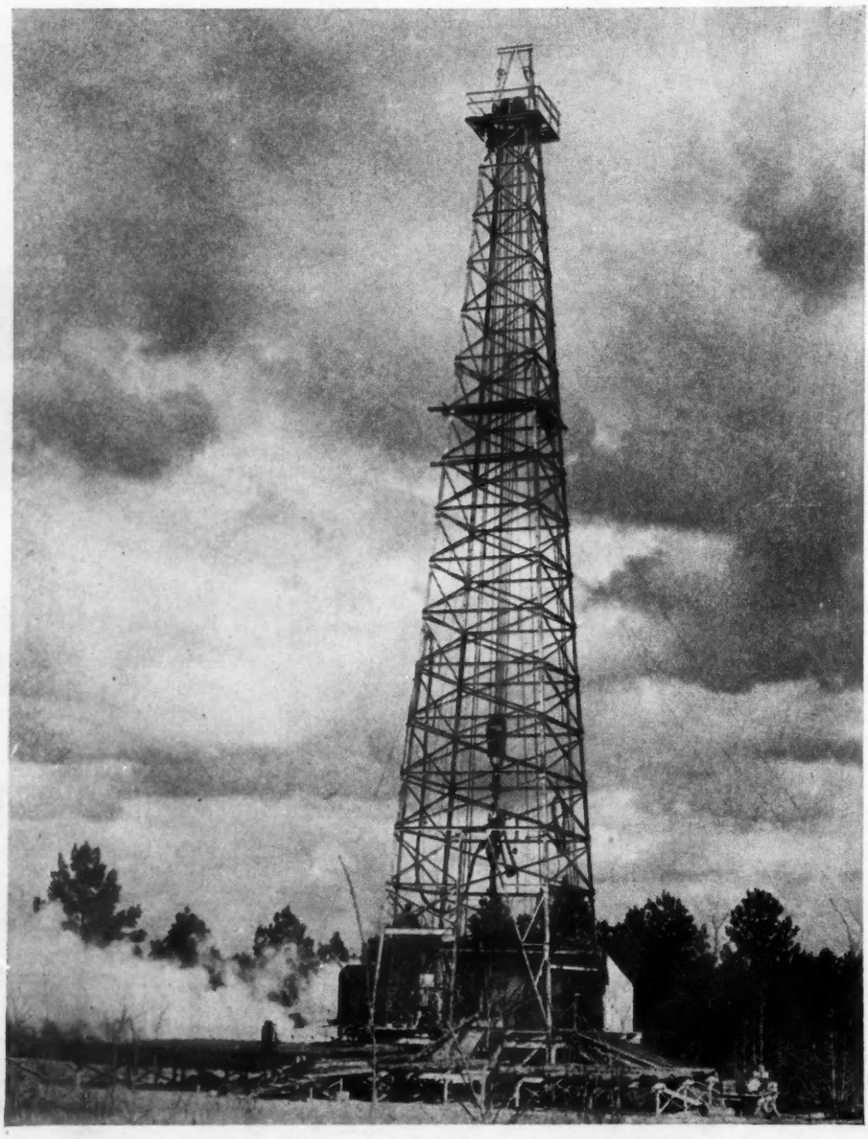
DRILLING

Both 124-foot and 136-foot derricks are used for Rodessa drilling. Heavy-duty rigs are required. Most boiler plants have three boilers with a few four-boiler hookups in use. Drilling engines are 12 x 12. Two slush pumps, 18 x 20, are the common hookup.

Drag bits are used for making hole until surface pipe is set around 200 feet. Hard formation bits make the remainder of the hole.

Testing the saturated sections requires an average of six cores per well.

Drilling time is 45 days, which includes setting casing. Average cost is $60,000 for a well hooked up to flow.



CASING

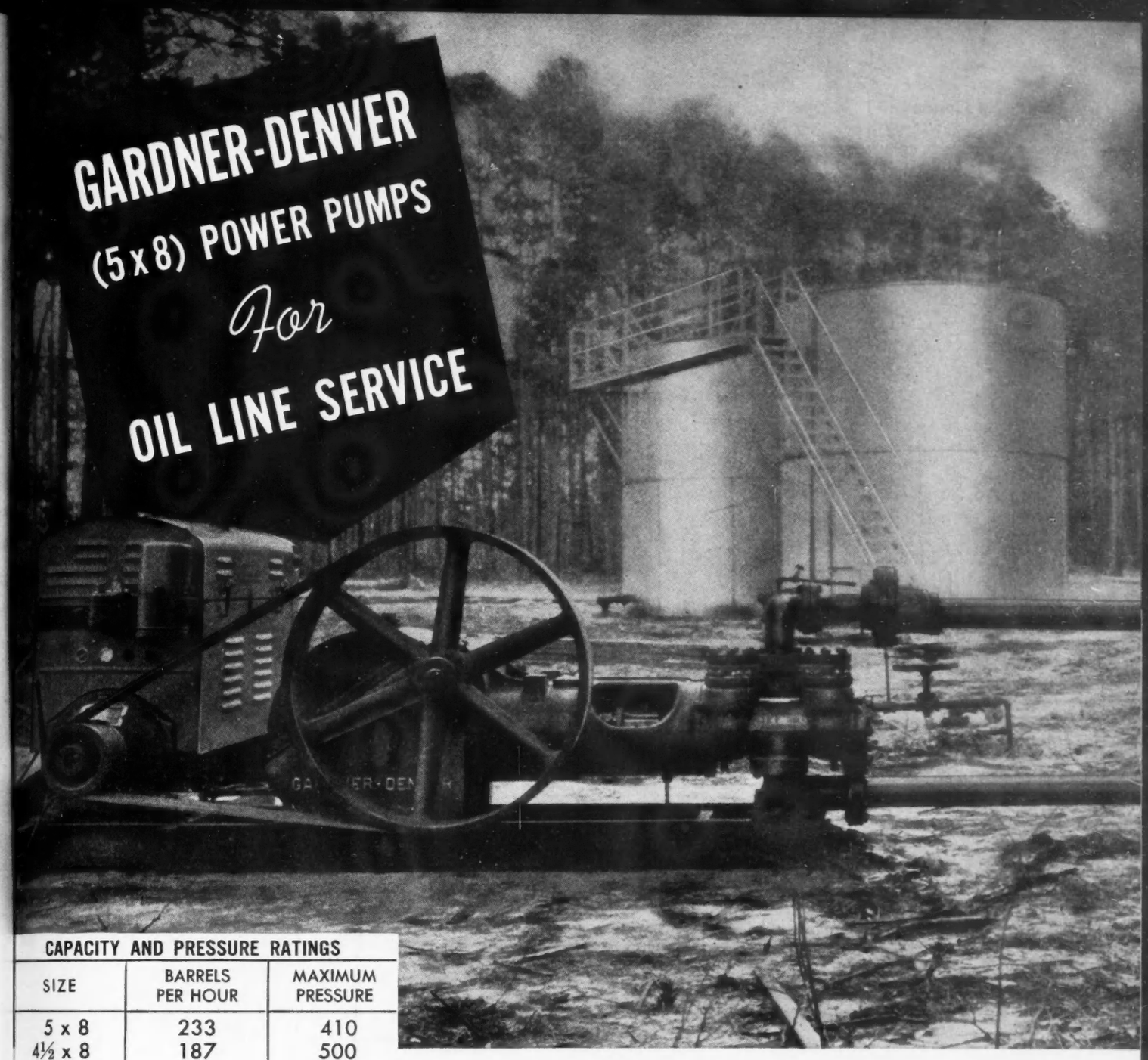
Surface casing, 13⅜ inch, is set at 200 feet and cemented to the surface.

An intermediate string, 9⅝ inch, is landed at 2000 feet and cemented with from 400 to 800 sacks.

The oil string, 7 inch, has an average setting depth of 5950 feet and cemented with 250 to 400 sacks.

Liner is usually run with the oil string.

Tubing, used in all wells, 2½ inch, is usually run to 10 feet off bottom of the hole.



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SIZE	BARRELS PER HOUR	MAXIMUM PRESSURE
5 x 8	233	410
4½ x 8	187	500
4 x 8	146	640
3 x 8	77	1135
2½ x 8	50	1630

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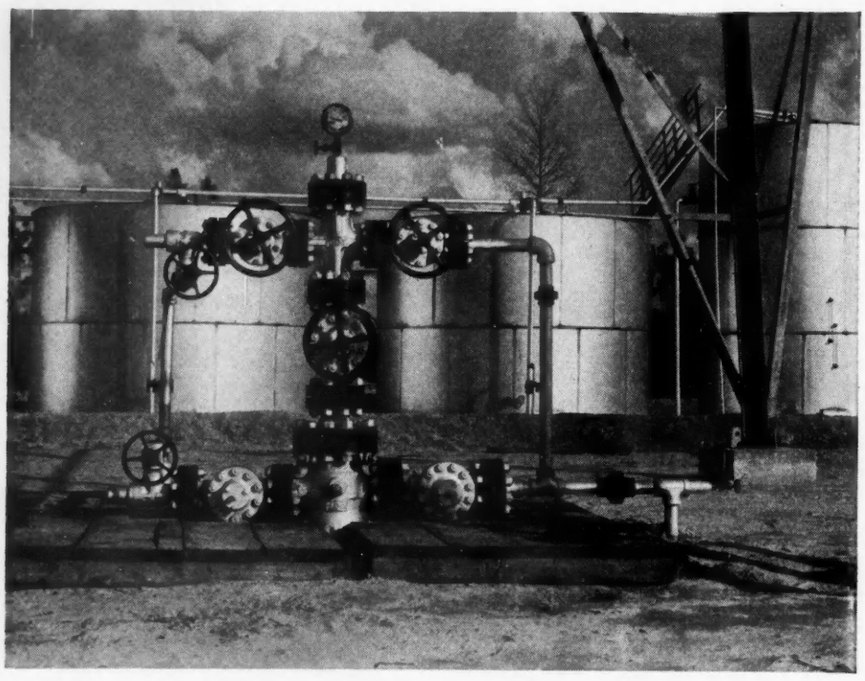
[Rodessa Continued]

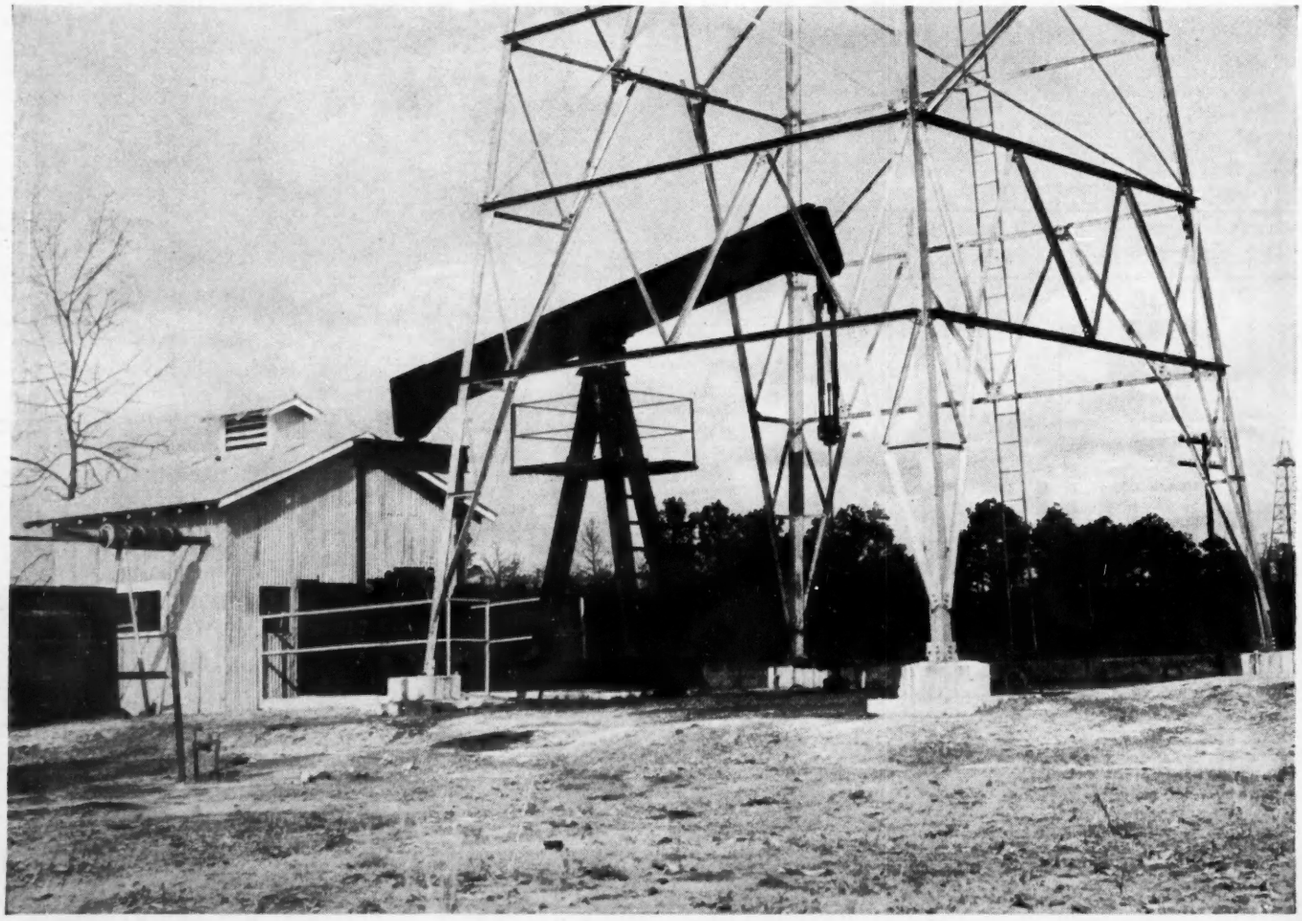
PRODUCING PRACTICE



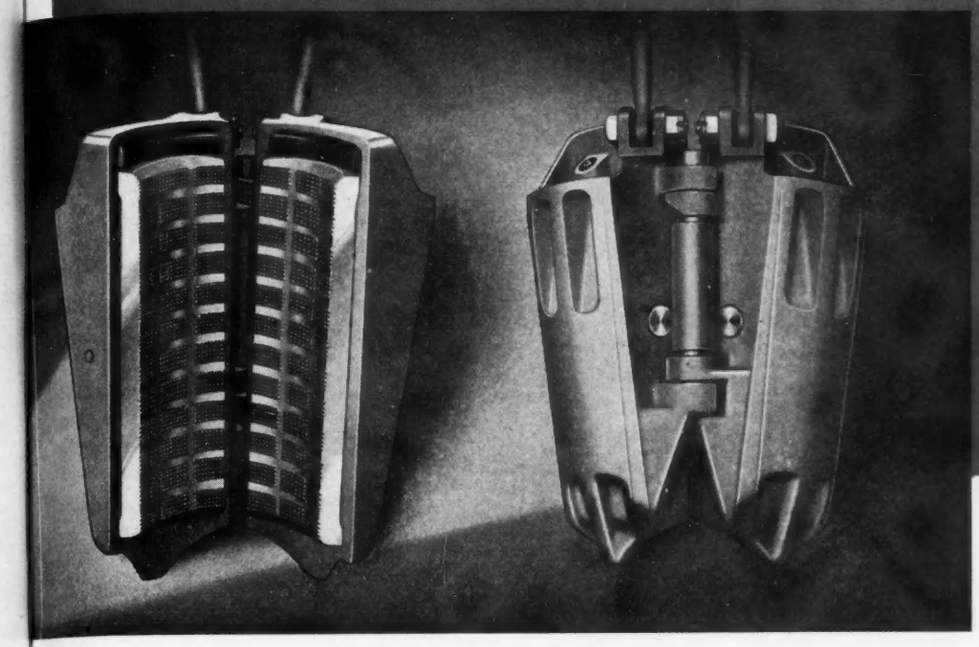
All wells flow through tubing, chokes ranging from 8/64 to 15/64.

Thus far the wells that have been forced to gas lift have been hooked onto gas wells in the field and rock pressure used. Flowing is usually restored by brief application of gas lift. The field has only 30 wells on continuous gas lift.

Pumping is by single well units, both electric motors and gas engines being used for power. Pumping is from the bottom of the hole. There are only 35 pumping wells. However, many wells are expected to cease natural flow during the year.

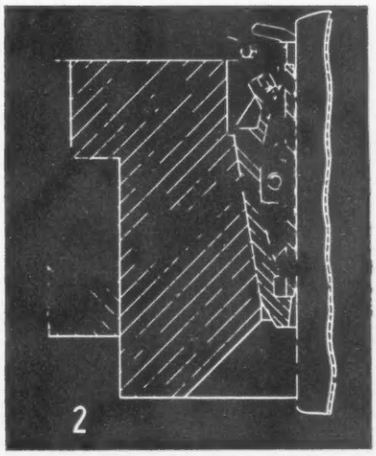


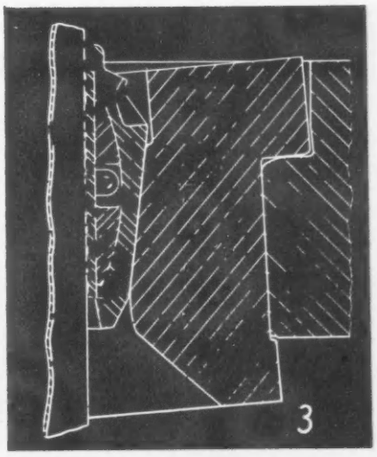
BAASH-ROSS



Self-Aligning ROTARY SLIPS

AUTOMATICALLY COMPENSATE FOR CHANGE IN TAPER OF THE MASTER BUSHING BORE—INSURE FULL-LENGTH GRIP ON PIPE IN ANY POSITION





HOW THEY OPERATE

1. **Liners are supported laterally by curved backing plates. When weight is applied, liners and backing plates oscillate—gripping surfaces are automatically aligned perfectly with the pipe.**

2. ***These Self-Aligning* rotary slips automatically compensate for the misalignment due to deformation under heavy loads that occurs even in a new rotary and unworn master bushing.**

3. **Full-bearing, effective, gripping contact of the liners with the pipe in any position is assured by the exclusive Self-Aligning feature when the rotary and master bushing are worn or permanently deformed.**

CONCENTRATION of PRESSURE on PIPE ELIMINATED

NO MORE kneading, crushing, cutting of the pipe every time the slips are set. *Uniform* distribution of the weight of the string over the entire area of the gripping surface of *all* liners is assured by the exclusive Self-Aligning principle.

Baash-Ross Self-Aligning Rotary Slips save money and avert the danger of costly fishing jobs by protecting your pipe from becoming weakened and damaged. Send today for the illustrated bulletin that describes their many advanced safety features.

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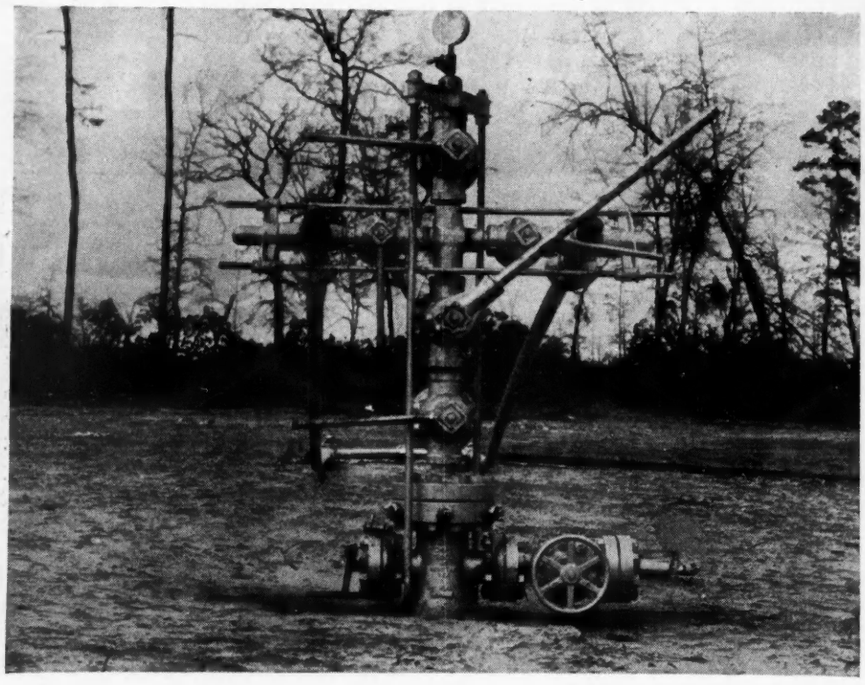
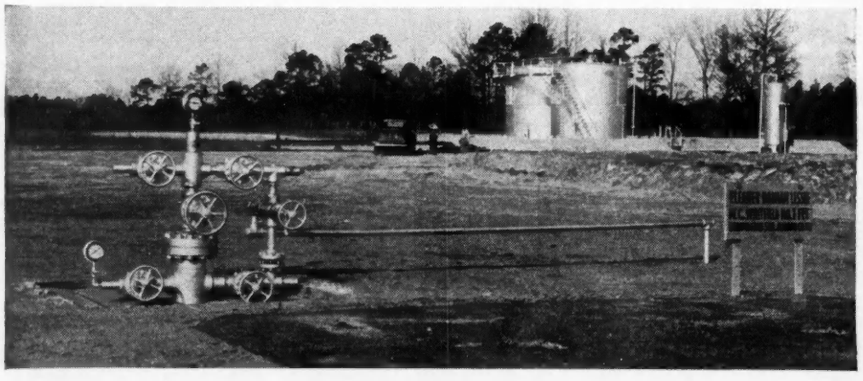
[Rodessa Continued]

SURFACE EQUIPMENT

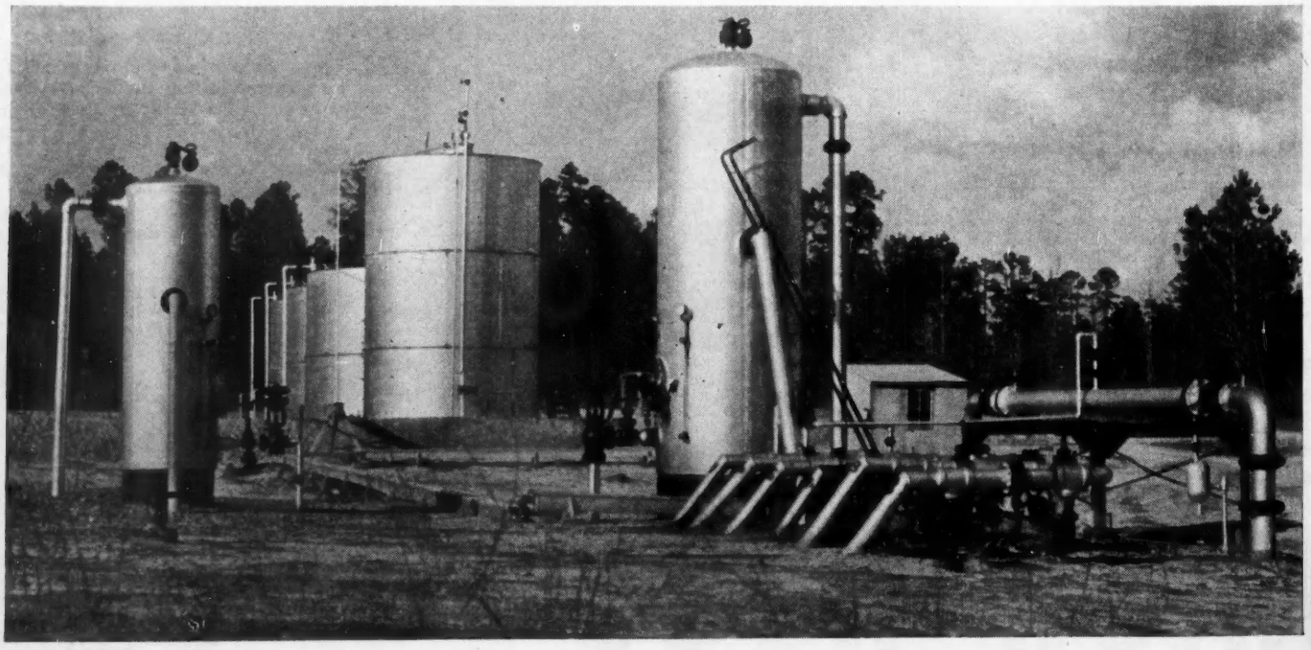
Heavy-duty Christmas trees, tested to 10,000 pounds, were required on all early completions at Rodessa. This type is still essential for parts of the field where pressure has not been reduced. For inside wells in older parts of the field, flowing devices of 6000 pounds test are sufficient.



Double flow line assemblies are used in all the heavier well head installations. Single flow line units may be used for the lower pressure wells in older parts of the field.



One separator and two flow tanks are the accepted practice for each well.



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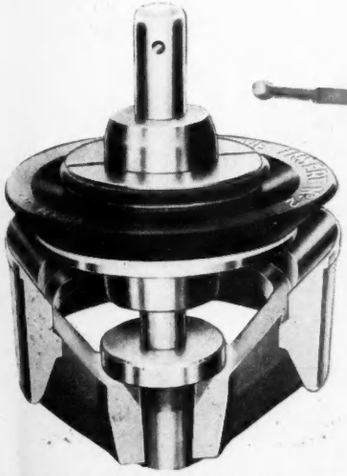
Model 36



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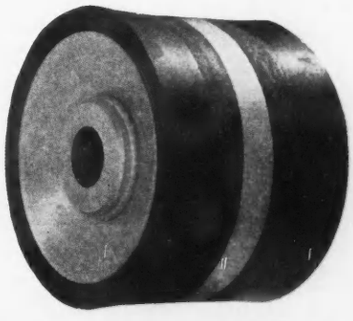

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Swabs 3 to 15 times faster . . . with SAFETY

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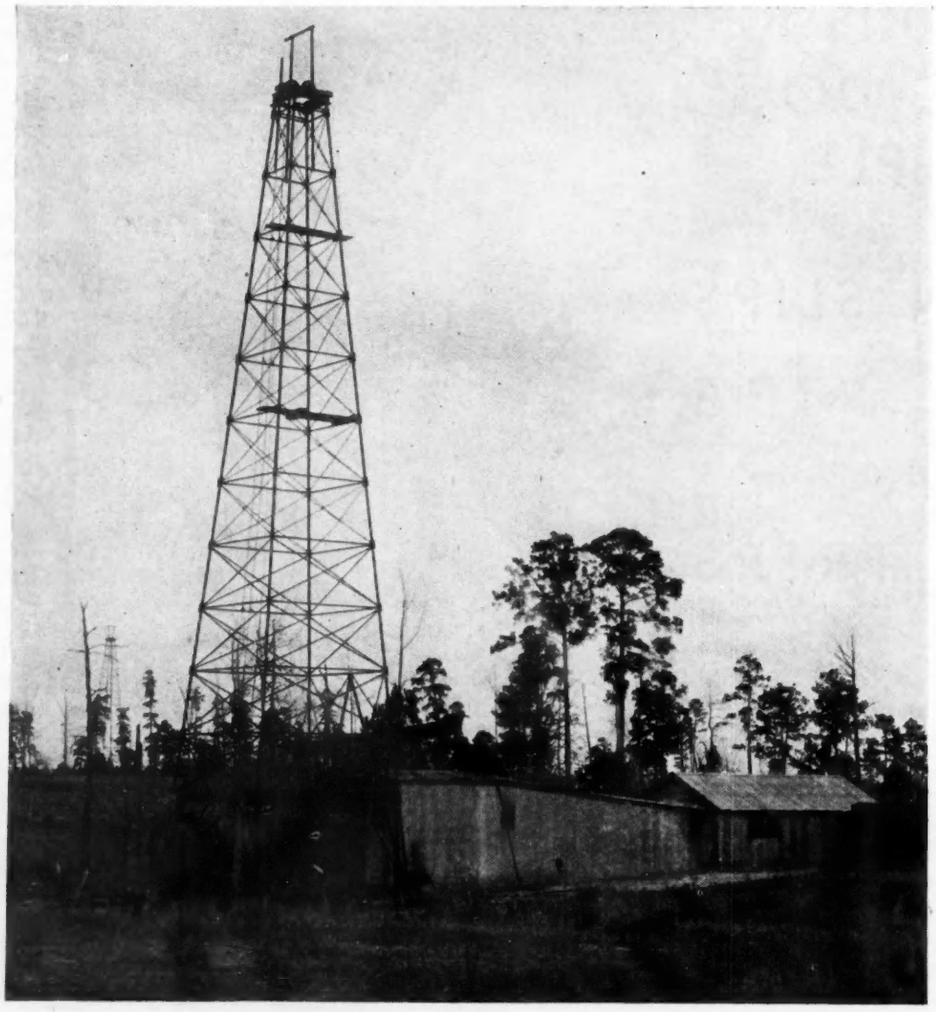
Cotton Valley

AREA

Productive area for the Bodcau sand wells is 2080 acres.

Final development, which will be slow on account of depth and cost, is expected to embrace at least 10,000 acres.

Cotton Valley is looked upon as one of the outstanding reserves of North Louisiana.



HISTORY

First oil production at Cotton Valley was from the Blossom sand, first drilled in 1923 and developed in 1924. Blossom sand wells are still pumping, despite low output, in order to hold leases for deeper drilling.

In 1926 an Anhydrite zone of the Glen Rose yielded oil from two wells, but this formation is chiefly a source of gas.

Deeper drilling was started in 1925, and in 1936 Holloway sand (lower Trinity) was found productive below 5500 feet. There are now five wells producing from this formation, which is not uniform over the structure.

The lower Marine, 8200 feet to 8400 feet, known locally as the Bodcau sand, was found productive in January, 1937, and is now the objective of 30 drilling wells. This formation, which produces gas and distillate, has 32 wells flowing. Drilling is on 80-acre spacing to date.

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The superior designing, workmanship and quality of Green Head Products keep them in the lead always. And when you use Green Head Products, you're sure to get extra satisfactory results. Don't take our word for it. Give Green Head products a trial and learn for yourself.

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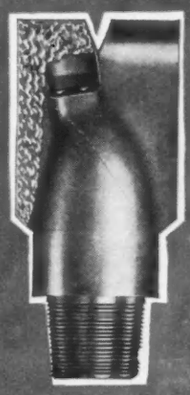

2-WAY BIT

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Each bit is faced and inserted with the best hard surfacing material available and each circulating hole is inserted with special hard metal, replaceable bushings. They're "bears" for wear.

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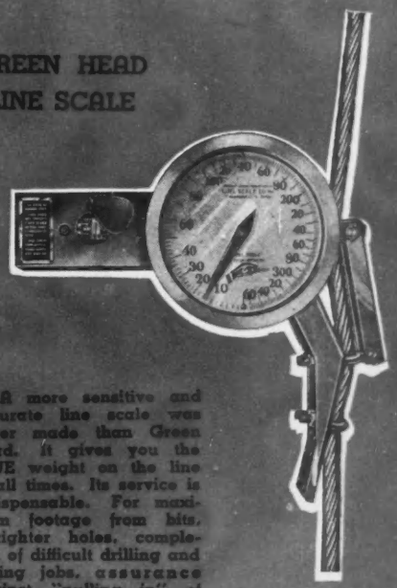
3-WAY BIT

GREEN HEAD LINE SCALE



• A more sensitive and accurate line scale was never made than Green Head. It gives you the TRUE weight on the line at all times. Its service is indispensable. For maximum footage from bits, straighter holes, completion of difficult drilling and fishing jobs, assurance against "pulling in" of derrick, use the Green Head!

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DRILLING

Deep drilling at Cotton Valley calls for the heaviest rotary equipment because of depth and high pressures. Both 124-foot and 136-foot derricks are used.

Three and four boiler hook-ups are required for steam. Single and double engine rigs are used. The field affords ample soft water from wells.

Colloidal matters are added to bring mud to required weights before drilling into the high-pressure lower Marine.

Drag bits make the hole until surface casing is cemented. Remainder of the hole is with hard formation bits.

Drilling time to the lower Marine is three to four months. Cost of the deep holes is $125,000.

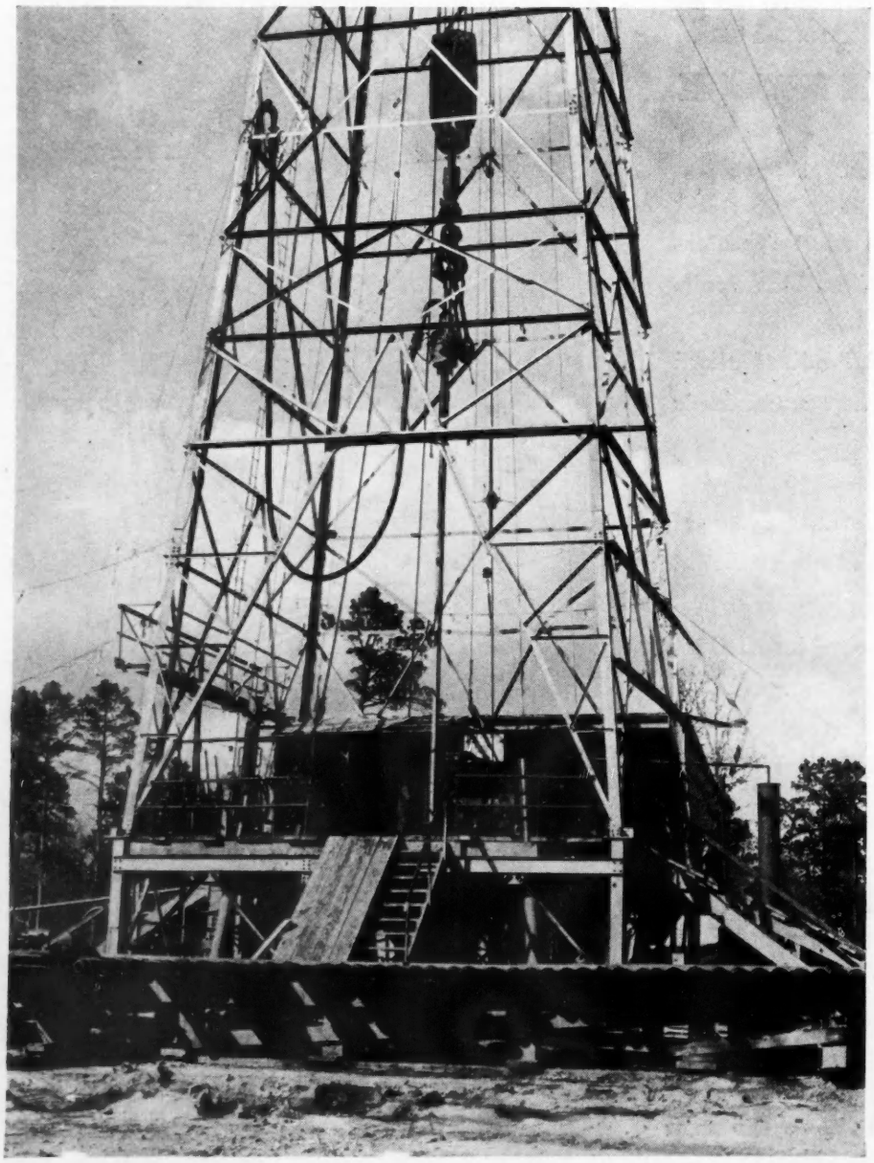
CASING

Surface pipe, 13⅜ inch, is landed around 850 feet and cemented back to the surface.

The intermediate string, 9⅝ inch, is landed around 5600 feet, and cemented back into the surface string. If electrical logging justifies, the Holloway sand is tested for production.

The producing string for the deep wells, 7 inch, is set around 8200 feet and cemented with 650 sacks.

Production from either the Holloway or the Bodcau sands is through 2½-inch tubing.



GEOLOGY

Structure for the field is classed as an anticline. It has gas at the top and oil on the flanks.

Since the Holloway sand, lower Trinity, is not uniform, the Bodcau sand, lower Marine, is the chief source of production. Saturation may be found within a section of 200 feet.

Wells are so cased that they may be produced from the Holloway sand, where it is found. Otherwise the hole is carried to the Bodcau, which yields gas and distillate.

Average bottom-hole pressure, shut in, for the Bodcau sand is 3200 pounds.

Again — IT'S PURCHASED *Electric* POWER

BECAUSE THE OPERATOR IS ASSURED OF:

DEPENDABILITY
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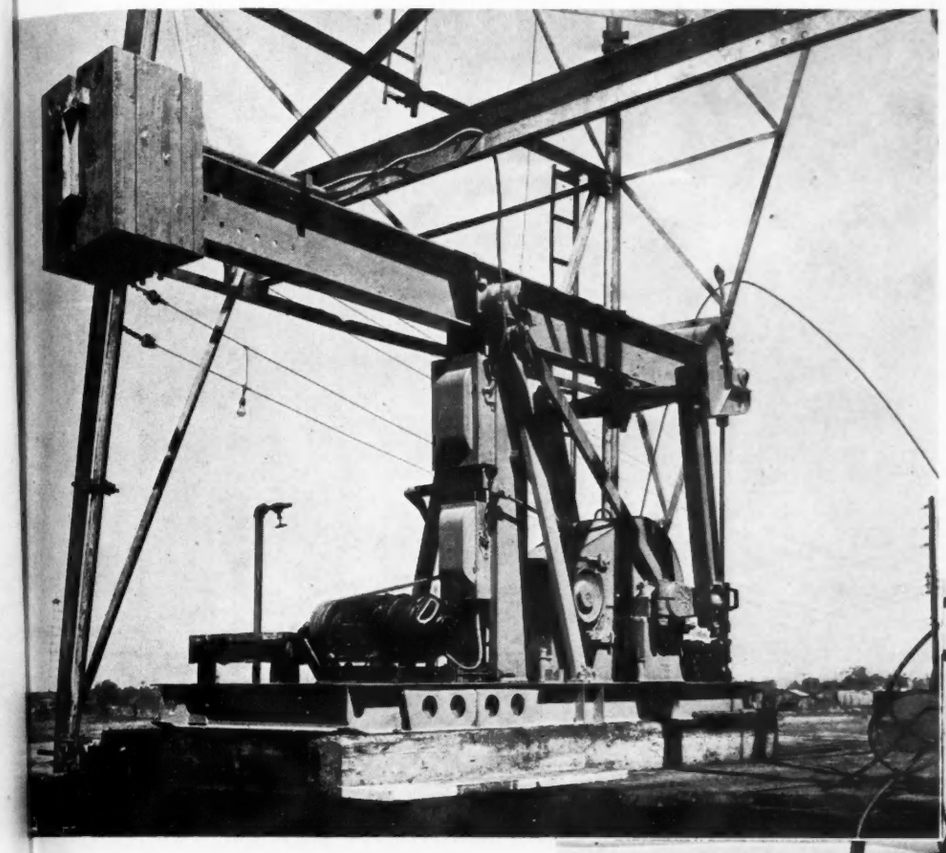
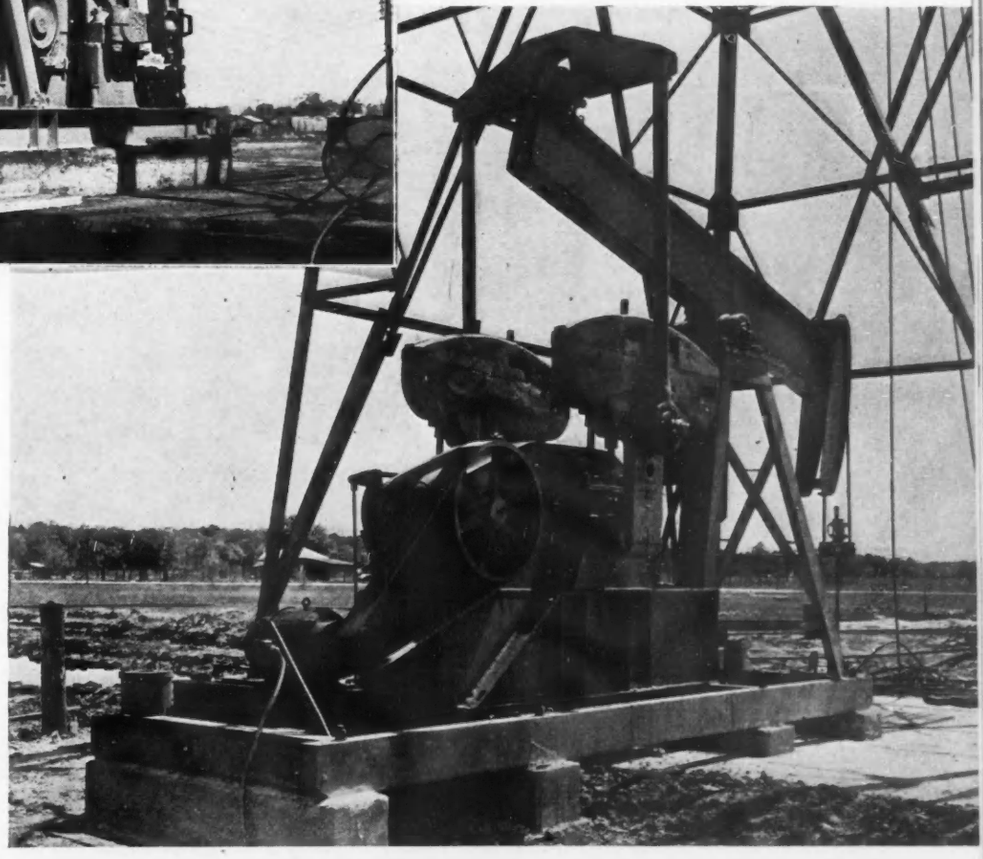
LOW MAINTENANCE
LONG LIFE
HIGH SALVAGE VALUE
TROUBLE-FREE OPERATION
SAFETY
CLEANLINESS



Installed January, 1938 at Goose Creek, Texas

Unit above equipped with
5 HP Gearmotor.

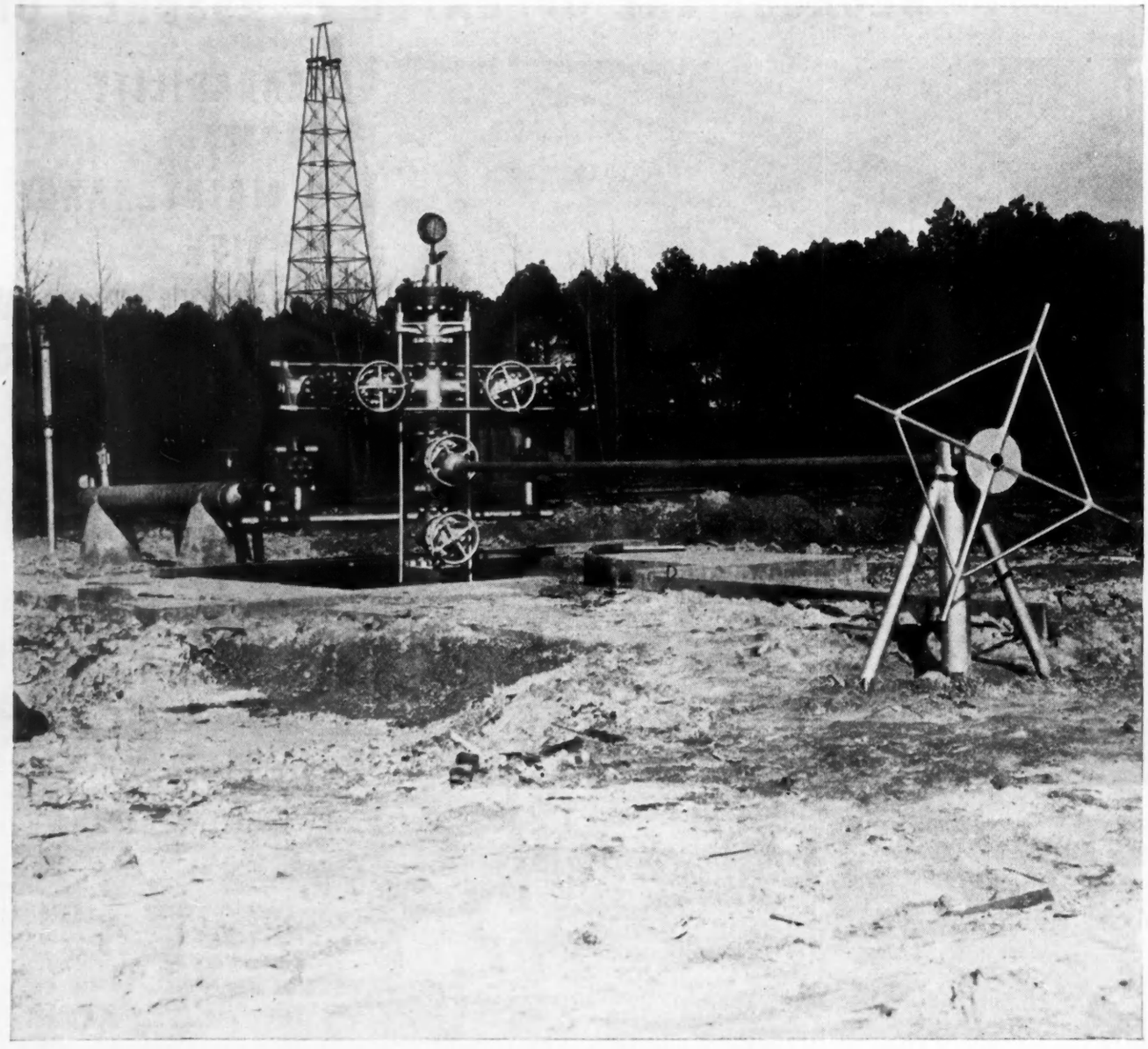
Unit at right equipped with
15 HP Splashproof motor.



Installed February, 1938 at Humble, Texas

HOUSTON LIGHTING & POWER COMPANY

PRODUCTION PRACTICES



Bodcau sand wells with shut-in bottom-hole pressure of 3200 pounds require Christmas tree assemblies of the heaviest type with remote control on the master gate.

Continuous flowing requires sush small choking that gas expansion results in line freezing, consequently heating devices are installed with steam as the agent.

Output is determined by gas production, the field having a daily allowable fixed each month.

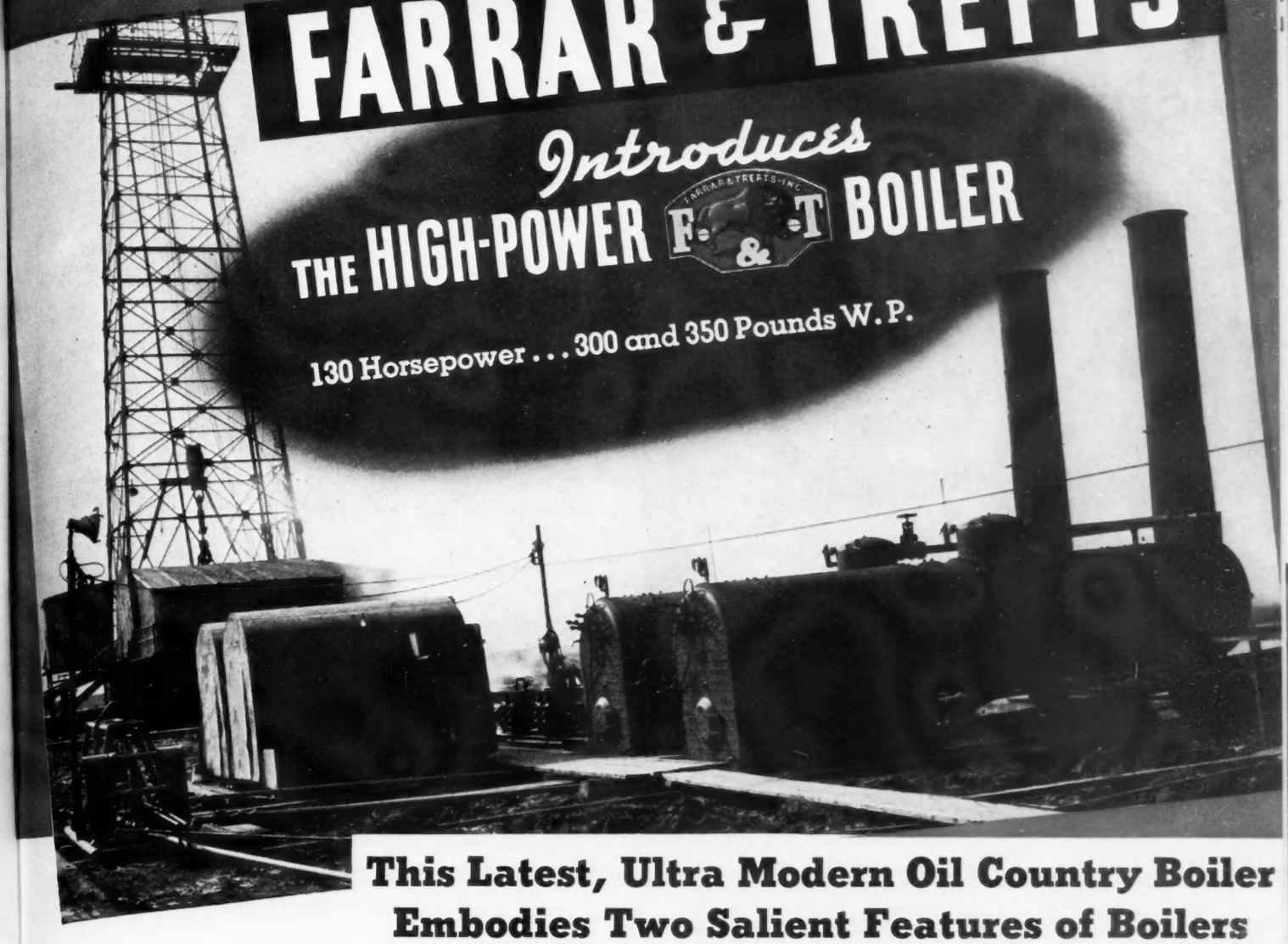
Some producers prefer to take the allowable over a part of the month so chokes can be larger and freezing prevented.

FARRAR & TREFTS

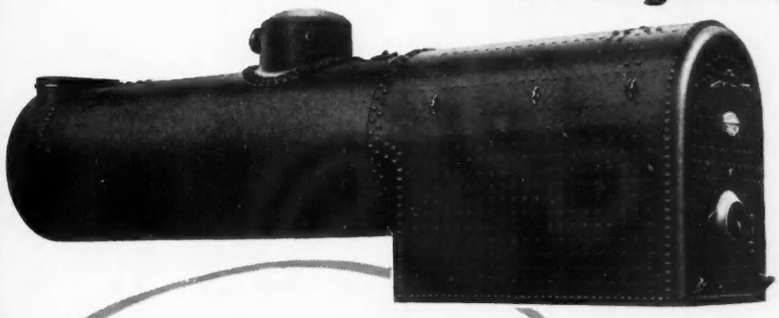
Introduces

THE HIGH-POWER F&T BOILER

130 Horsepower . . . 300 and 350 Pounds W. P.



This Latest, Ultra Modern Oil Country Boiler Embodies Two Salient Features of Boilers on High-Powered Locomotives



DISTINCTIVE
F&T FEATURES
FUSION WELDED BARREL
DOME AND FIREBOX

1

AN OVER-SIZE FIREBOX

98" long, providing longest possible burner arrangement, intense heat, high steam output. Actual boiler horsepower output is from 200 to 250 per cent of rating with regular methods of firing.

2

A LOW DOME

. . combining the advantages of high steam take-off and low overall height. The steam is taken off over two feet above the water level, insuring sufficient "dryness". The over-all boiler height is less than nine feet. This low height is a great help in handling and moving and gives a modern, streamlined effect to the setting.

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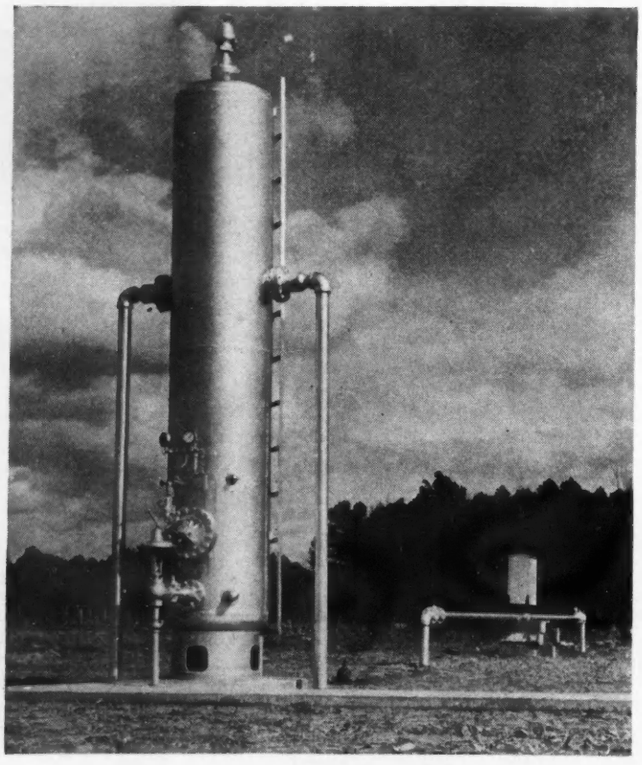
SURFACE EQUIPMENT

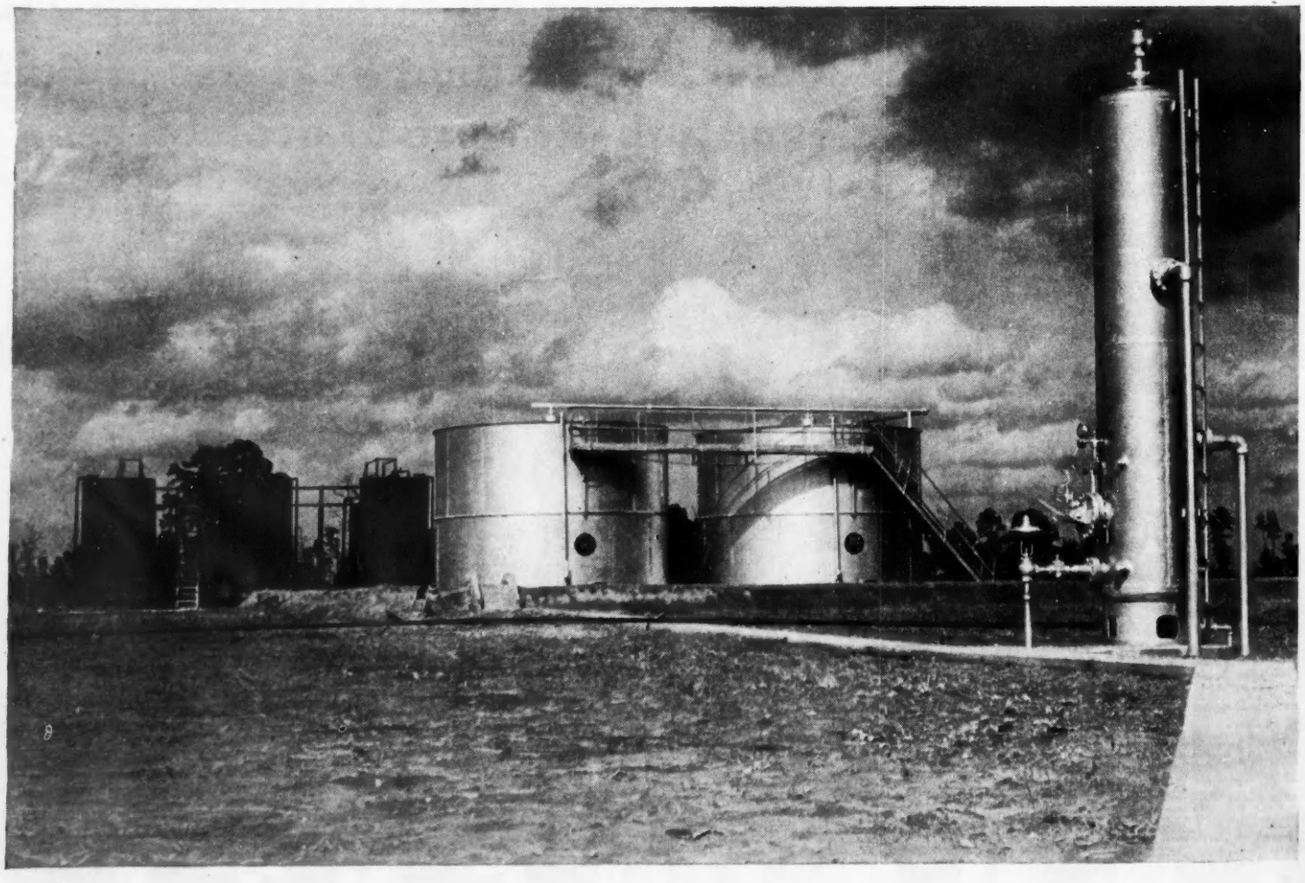


Since proration is geared to gas output in Cotton Valley, first consideration in flowing wells is the meter run, at one angle from the separator.

Each well has its separator and tank battery so gas output can be held within the amount prescribed by proration orders.

At the other angle from the separator are the flow tanks, which at Cotton Valley are filled with distillate.

These conditions apply to the Bodcau sand wells. Wells producing from the Holloway sand have flat daily oil allowables of 300 barrels.



it's built that way

Not only is your Composite Catalog convenient in that it contains the complete or condensed catalogs of 385 leading manufacturers of oil country equipment, **but the very form in which the material is presented** is itself most convenient for the oil man.

As a matter of fact oil men have written the specifications under which descriptive matter on equipment is presented in the Composite Catalog.

"Give us facts in such form that we can compare one piece of equipment with another," they have written us. This suggestion coming to us from several hundred oil men before the first Composite Catalog was published was made a basic part of our agreement with the manufacturers.

Information in the Composite Catalog is authentic and up to date. It is prepared by the manufacturers themselves.

COMPOSITE CATALOG

Lisbon

HISTORY

First oil at Lisbon came from the second well drilled by E. T. Oakes and associates, Patton Estate 2, NE NE 1-20n-5w, Claiborne Parish. It produced 200 barrels flowing from a lime formation, total depth 5379 feet.

This well was completed December 25, 1936.

Since then 173 wells have been completed. Total output to January 1, 1938 was 2,392,000 barrels.

AREA

Producing wells and drilling wells now cover 4000 acres, but field limits are yet to be defined. Some estimates of ultimate area run up to 25,000 acres.

Low daily output by flowing, as well as small recovery by pumping, have held drilling to an orderly pace.

It is possible that the porosity of the lime rather than the extent of the structure will determine the final producing area.

The acreage under development is about 70 percent drilled.

TRIPLEX HOOKS

"300" TRIPLEX

"150" TRIPLEX

"100" TRIPLEX

THERE'S A SIZE TO MEET YOUR NEEDS AND ALL HAVE SAFE BJ "LOCKING ARMS"

THE "300" is recommended for 300-ton loads, with a safety factor of three—safe for the longest and heaviest strings.

THE "150" is for wells of average depth where 150 ton loads are encountered. Neither Safety nor Operating Convenience have been sacrificed.

THIS NEW "100" is priced so low that the shallowest well can now enjoy "Triplex Hook Performance and Economy." Loads of 100-tons (with safety factor of three) are safely carried.

Full details and prices are in the 1938 Composite Catalog — and in the BJ Catalog, sent on request.

BJ

BYRON JACKSON CO.

FORT WORTH • LOS ANGELES • NEW YORK

DRILLING PRACTICE

Both 124-foot and 96-foot derricks used for drilling, since the shorter ones may be left during pumping life.

Rigs are semi-heavy duty for drilling as deep as 8000 feet.

Steam is the power and three-boiler batteries are used.

Two slush pumps are demanded for fluid circulation. Mud is made up in the field, which provides ample soft water from wells.

Drag bits make hold until surface casing is set. Below 850 feet hard formation bits are used constantly.

Coring is done in the producing formation.

Drilling time averages 30 days.

Cost is $40,000 for a flowing well.

GEOLOGY

Structure is a flat anticline. Oil accumulation is the Pettit lime of the lower Glen Rose. It responds to acid treatment and 90 percent of completions are acid treated. Porosity holds major control over accumulation of oil. This makes for short flowing life in some wells. Pumping is the next stage in recovery.

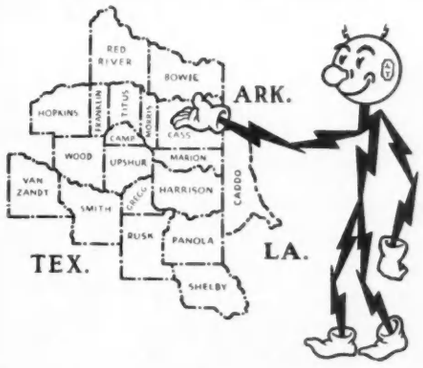
CASING

Surface pipe, 10 inch, is set at 850 feet and cemented to the surface.

The oil string, 5 inch, is landed on top of the Pettit lime and cemented with 500 sacks.

Tubing, 2½ inch, is swung into the hold with a perforated joint in the productive zone.

Here's my territory . . .



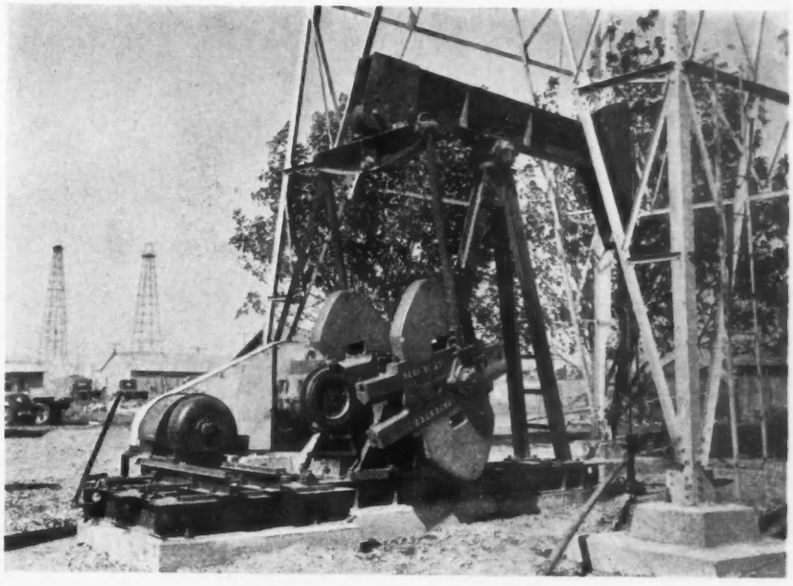
Here's my advantages . . .

—says REDDY KILOWATT
your electric servant.

1. **Low first cost and low maintenance cost.**
2. **Low fixed charges (taxes, interest, insurance, depreciation, etc.)**
3. **Less trouble, fewer repairs, smoother operation, easily moved.**
4. **Longer life — higher salvage value.**
5. **Smaller warehouse stock of repair parts.**
6. **Fewer accidents and less fire hazard.**
7. **Easy to start in any weather.**
8. **Operation can be controlled automatically.**
9. **Counterbalancing easily accomplished.**
10. **Accurate records easily kept.**
11. **Less shut-down time.**
12. **LOWER OVER-ALL COST, PER BARREL, OF FLUID LIFTED.**

PRODUCTION COSTS GO DOWN

in East Texas and Rodessa with PURCHASED ELECTRIC POWER



Purchased electric power is the modern power for the production of crude oil. Major operators and independents realize the cost of production goes down when they start using purchased electric power for pumping, pipelines, gathering stations and refineries.

There are many advantages derived from purchased electric power. In the column at the left, we have set down some of the outstanding advantages. Read and study them. If there is any information you desire about purchased electric power in the East Texas or Rodessa fields call us and let us send our representative to discuss electric power with you.

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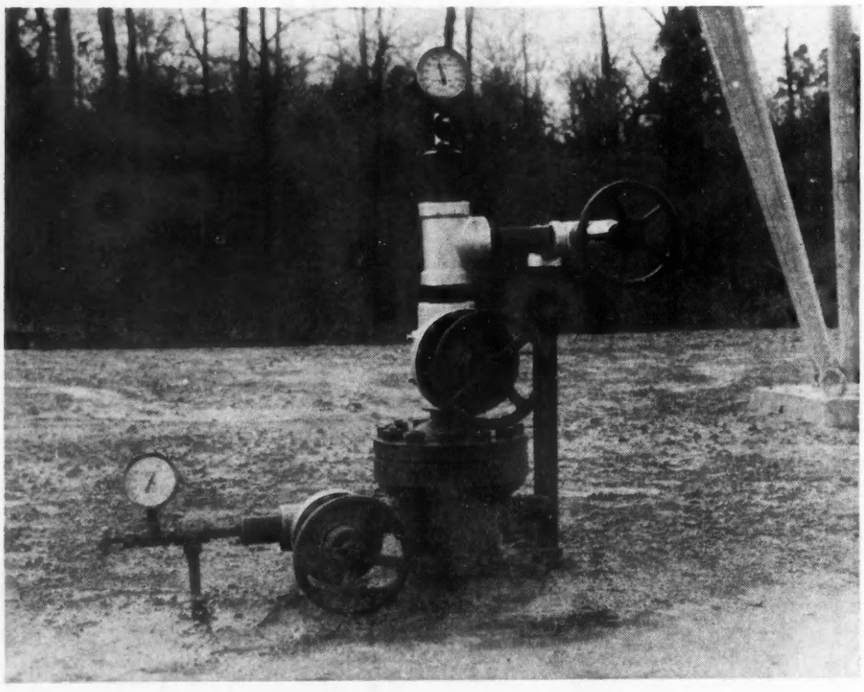
PRODUCING PRACTICE



Because the tight lime gives up oil slowly, the flowing life of Lisbon wells can be prolonged by getting an advantageous gas-oil ratio.

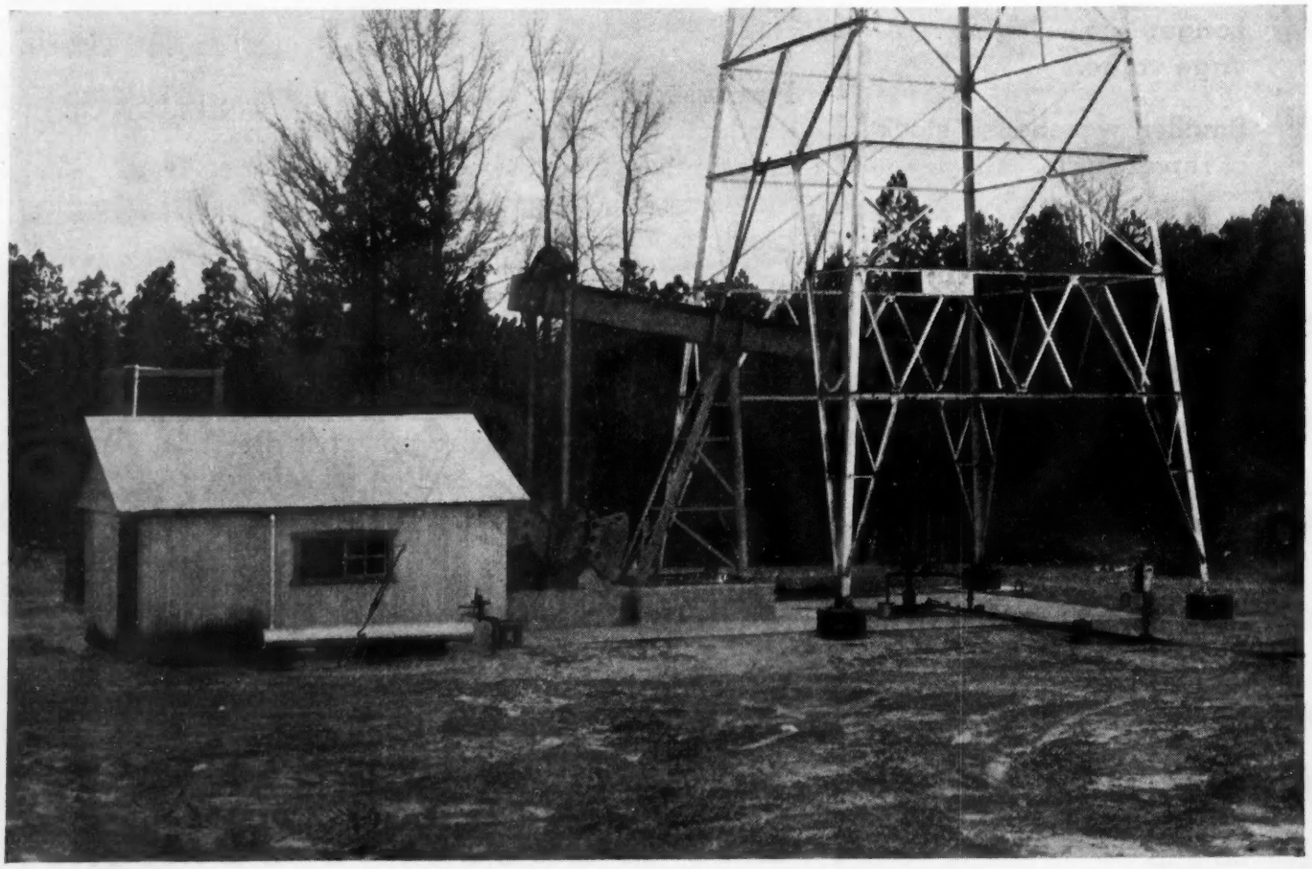
Well head equipment is of simple design, since pressures are not excessive.

Flowing life varies from well to well with producers experimenting to get the most from reservoir pressure.

Acid is used to a large extent in completing wells.

Erratic flowing life of Lisbon wells results in pumping equipment being installed shortly after wells are completed.

Single well pumping units, gas en-



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Nine strategically located **SHELL** *Refineries*

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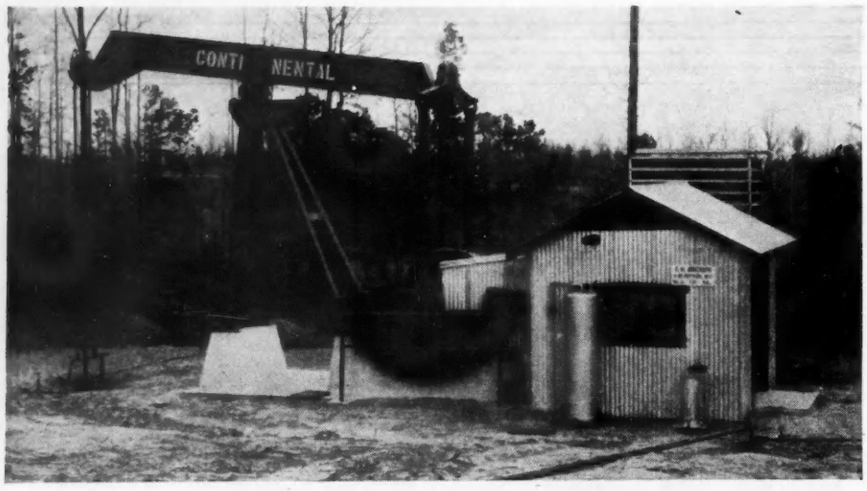
MID-CONTINENT
EAST CHICAGO, IND.; WOOD RIVER, ILL.; ARKANSAS CITY, KANSAS

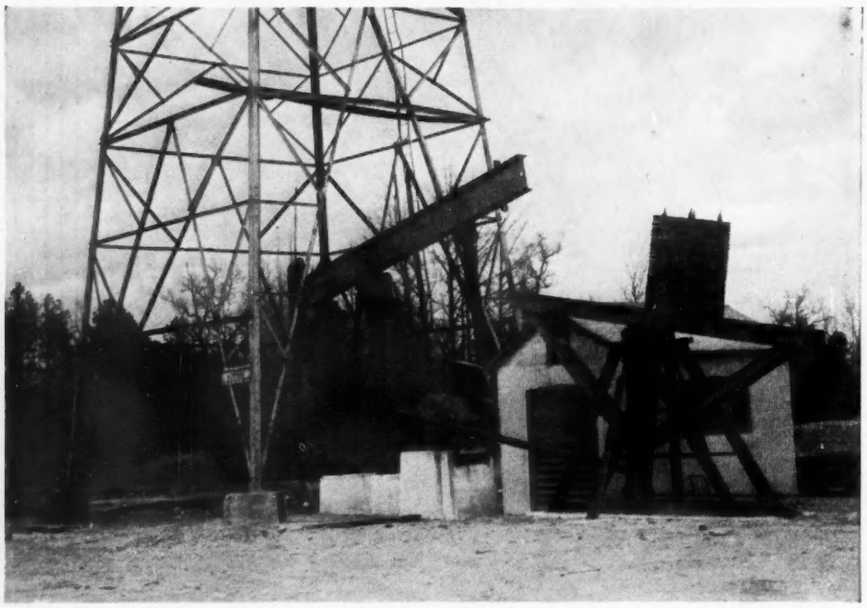


[Lisbon Continued]

gine driven, with strokes from 72 to 84 inches are most widely used.

A few double well hookups are used.

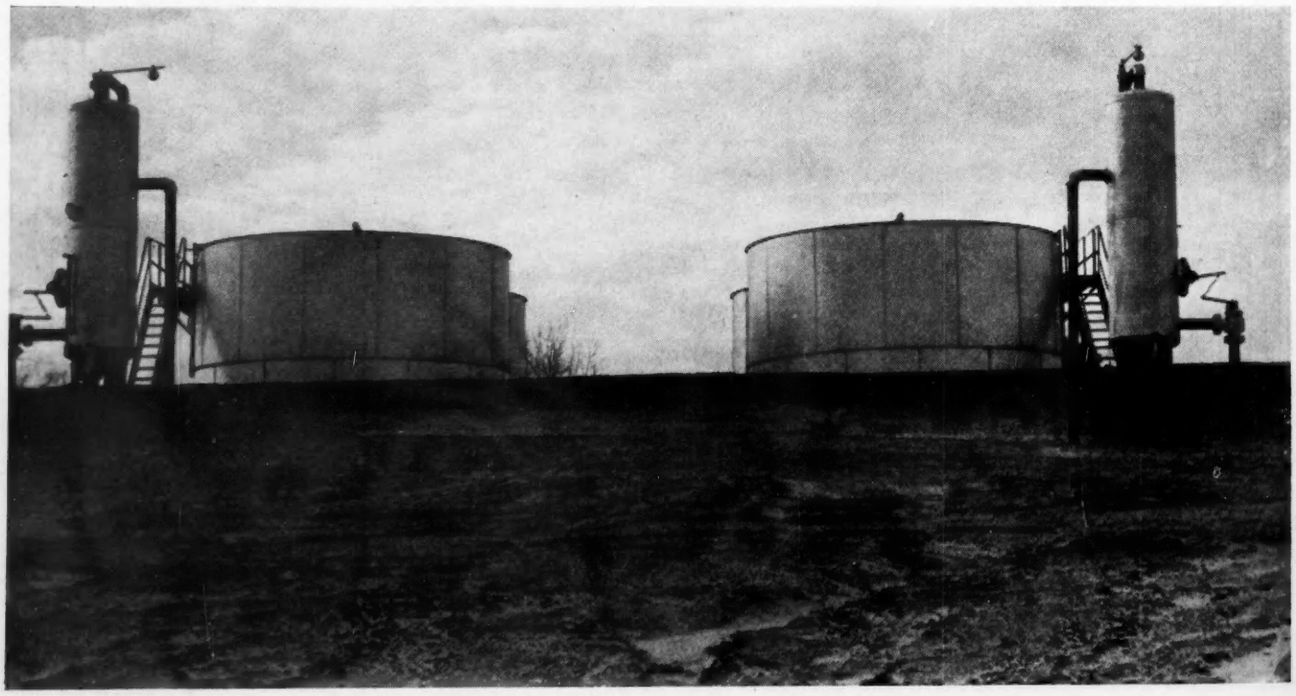
Frequently pumping is started while wells are still flowing small output.

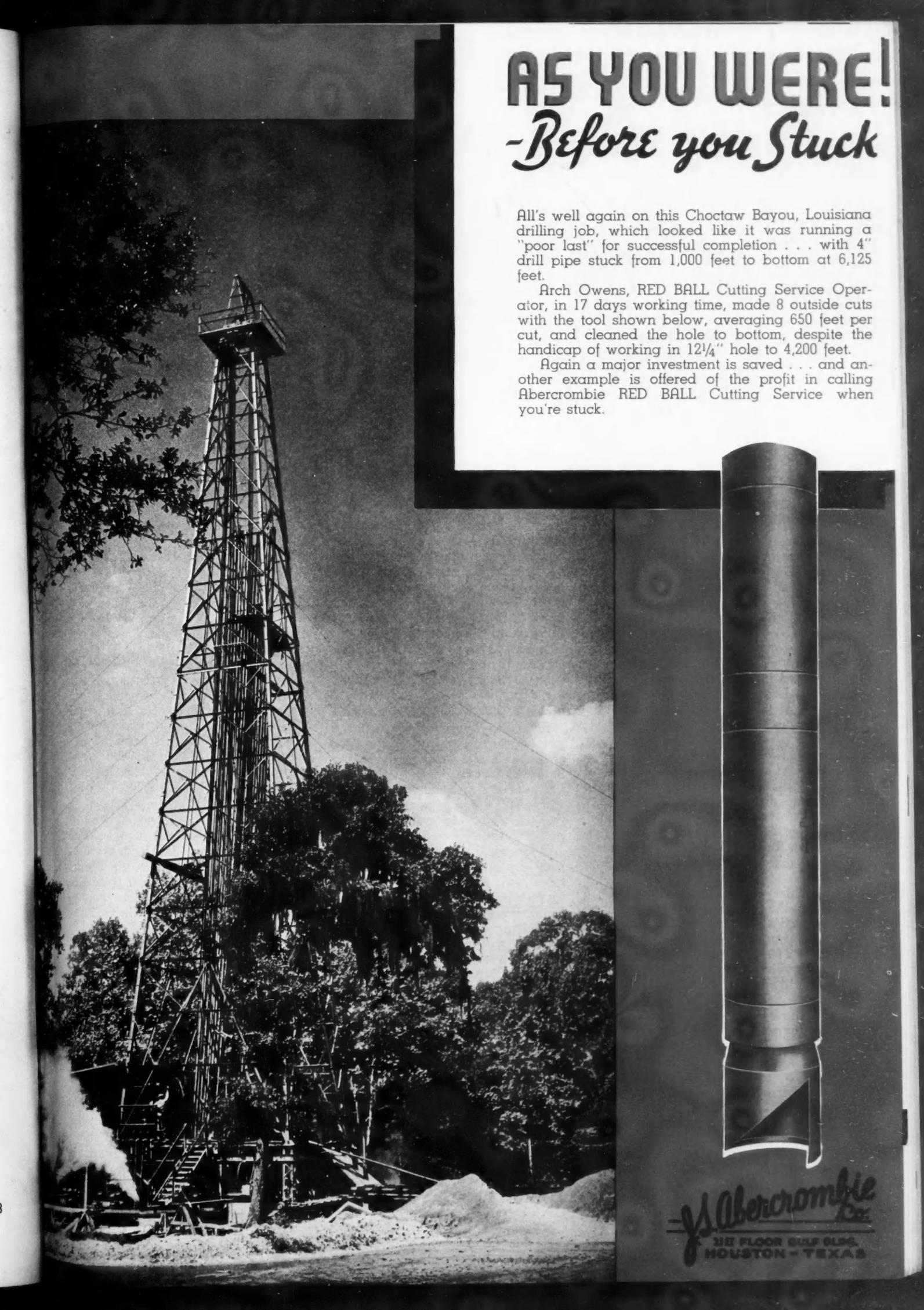


TANKAGE

Low pressures and small well output allow tank batteries to be provided for leases rather than single well batteries at Lisbon.

Tank and separator installations are provided for long use, since the field is expected to have long life along with comparatively low daily output.




AS YOU WERE!
-Before you Stuck
All's well again on this Choctaw Bayou, Louisiana drilling job, which looked like it was running a "poor last" for successful completion . . . with 4" drill pipe stuck from 1,000 feet to bottom at 6,125 feet.
Arch Owens, RED BALL Cutting Service Operator, in 17 days working time, made 8 outside cuts with the tool shown below, averaging 650 feet per cut, and cleaned the hole to bottom, despite the handicap of working in 12¼" hole to 4,200 feet.
Again a major investment is saved . . . and another example is offered of the profit in calling Abercrombie RED BALL Cutting Service when you're stuck.
J. S. Abercrombie Co.
2ND FLOOR GULF BLDG.
HOUSTON - TEXAS

North Louisiana

Performance Record

While past productivity records of area are attractive, recent discoveries of new deeper sands forecast more important developments

By FRANK B. TAYLOR
Staff Writer

NORTHERN LOUISIANA has witnessed a steady, virtually uninterrupted march of development from the discovery of Caddo in 1906 to the present time. Shallow drilling depths and sustained production in early strikes were attractive inducements to both the investor and wildcatter. With demand establishing the high prices posted in 1920, the sector found itself launched upon the program that today has resulted in the production of 441,287,720 barrels. However, this figure does not reveal the true importance of the region, for it is calculated a total of 758,995,620 barrels of oil have been discovered, indicating the region has proven unproduced reserves of 317,707,900 barrels at this time. Recent developments forecast the discovery of much additional oil.

Thirty-two oil, gas and distillate fields have been discovered. Three of these produce natural gas only, the Monroe field receiving general credit for being thethird largest gas reservoir in the United States should more reasonably be classed as second largest, through reason of the evident continuance of the Panhandle and Hugoton fields. The three major gas areas in Northern Louisiana cover at least 282,800 proven acres, and at present produce from 1260 wells. Far distant markets are supplied with fuel from these fields and from oil pools producing under gas/oil ratio.

With the modern trend in the search for crude reserves reaching increasing depths and new types of accumulative structures, a number of strictly distillate fields have been opened. There are four such type fields known at this time, and from recent drilling and exploratory work it is reasonable to expect an increase in the number of this type of field. In regard to distillate fields, the expansion of natural gas gathering systems will provide outlet for a portion of the stripped gas, making the distillate available.

Secondary recovery has not as yet become a general part of operations in the area to date. Two fields have advanced programs of pressure maintenance, and 90 percent of all operations are conservative of reservoir energy. To the present time porosity, saturation and permeability tests of strata semi-depleted by natural means have been few. There is no reason to assume that secondary recovery by water flooding and by gas repressuring cannot be profitably applied in a number of instances as water is readily available, and gas is obtainable at required pressure from normal and distillate wells.

Proven acres productive of oil, exclusive of strictly natural gas areas, total 162,685. These areas of production, embraced in 29 pools, are within 15 parishes, with production generally concentrated in the northwest sector of the State. Total average daily production from 3380 wells is 78,500 barrels with pipe line facilities ample in the majority of cases.

In looking at the productivity angle of the fields, it is interesting to note that the average number of pay horizons in each field is 2.64 productive strata. The average yield, per acre per field, is now 5000 barrels. This is considerably higher than the average yield per acre gauged on the basis of all acres, economically productive or not, enclosed within the productive limits of the pools. Assuming production operations will be carried to normal depletion, there still remains a recoverable 3800 barrels per acre per field. This is shown in the total estimated unproduced but discovered reserve of 317,707,900 barrels.

Homer field, Claiborne Parish, is the most prolific field discovered to date. Nacatoch and Buckrange sands produce at depths less than 3000 feet, over an area of about 2500 acres. To the present time the per acre recovery has been 26,380 barrels. About one half this amount remains to be produced. Four fields have gone above the 10,000-barrel to the acre mark with the ultimate still to be obtained.

In area, the highly productive Caddo District on the flank of the Sabine uplift is the largest, embracing some 60,000 acres and to date has accounted for 145,548,000 barrels of crude with 30,000,000 still remaining. Production is irregular in areal distribution due to changes in pay thickness, structural features of the area, and porosity. The same general conditions prevail at Zwolle, another area comprising

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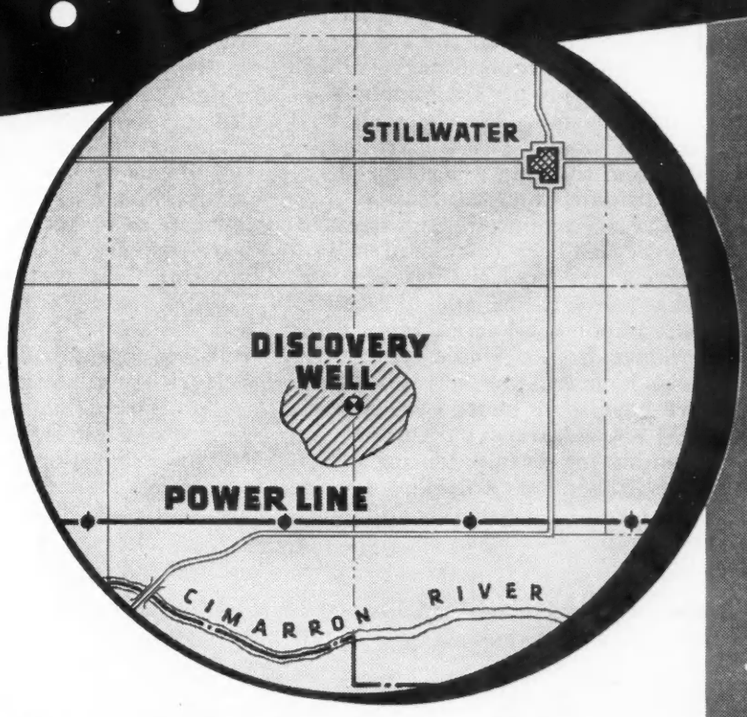

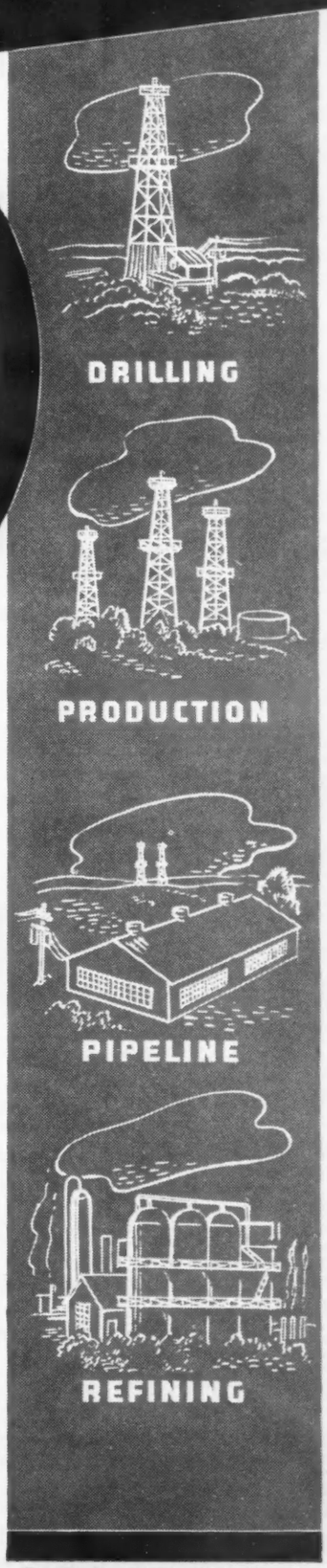

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Purchased ELECTRIC POWER

If you anticipate operations in the new Stillwater field, investigate Purchased Electric Power for your needs. We will be glad to discuss your power problems without any obligation to you. Plan to use Purchased Electric Power and increase your profits.

• READY POWER at your finger tips . . . in the exact amount to do the job you want done . . . Power that assures maximum efficiency and costs you less in the end.

PROFIT! BY USING *Purchased* ELECTRIC POWER

OKLAHOMA GAS AND ELECTRIC COMPANY

Commercial Department

OKLAHOMA CITY — W. H. STUEVE — OKLAHOMA

closely related geological features superimposed upon a regional high. Approximately 60,000 acres are included within the proven confines of Zowlle, although productively, the area is spotted.

Crudes of the area are of mixed base, and although there are notable exceptions, they are predominately paraffin. Analysis, at station and refinery, shows the tendency toward paraffinic, rather than the asphaltic. Gravity of the crudes varies from as low as 14 to distillate, with most of the lower grades being fairly high in lubricating stock. Very little sour crude is produced, the largest field predominately sour being Lisbon which has shown sulphur percentages as high as 1.6 percent on test. Unobjectionable traces are present in a number of the lower gravity crudes. In general, the oils are easily handled, desirable in any market, and with production costs in line with market demand, the area is attractive to the industry.

Arkansas

[*Continued from page 88*]

crude. Estimates place the discovered recoverable crude remaining in the ground at 382,825,148 barrels. This gives the State a grand total of 830,615,000 barrels having been discovered. Of the crude produced to this time, Smackover has accounted for approximately 350,000,000 barrels with 1740 wells still making about 17,700 barrels per day, and showing a per acre recovery to date of 13,300 barrels.

The average producing acre's recovery has been calculated at 3500 barrels per pool, which is somewhat below the calculated recovery based upon total acres. Eight fields produce from a single strata, two fields have two productive horizons, five have three strata each and one field has a lenticular occurrence accounting for seven producing formations. This allows a working average of 2.1 sands per field. With the present trend to deeper exploration, there is no reason why this figure, and consequently the per acre recovery, should not be extended.

Crude from the various Arkansas' pools varies greatly in character. There is very light crude and heavy crude produced from the same pool, being radically different in composition and consequently, in use. Some low gravity crude is now being produced in areas of small production. Much of this is being treated locally, and is generally transported by truck.

The natural gas situation is not a fundamental part of the Arkansas development. There are no gas fields in this southern part of the State that are recognized as being important gas reservoirs. Farther north, in the vicinity of Fort Smith near the western State line, many wells have been drilled to gas pays, the fuel being consumed in nearby centers. Occasionally, shows of oil were reported in logs of these wells. Recent exploration in this general region has added interest in the possibilities of finding oil in this section.

North Louisiana Performance Record Indicates Importance of Area

FIELD	Discovery Date	Producing Strata and Depth	Proven Acres	Producing Wells	Daily Production	Cumulative Production	Yield per Acre	Unproduced Known Reserve*
Bienville Parish:								
Bear Creek	3-14-1937	Glenn Rose 5875 ft.; Travis Peak 6800 ft.	600	Shut in	Distillate	.....	.....	.....
Bisteneau	9- 8-1937	Glenn Rose 5200 ft.	200	Shut in	Distillate	.....	.....	.....
Driscoll	6- -1936	Glenn Rose 6100 ft.; Travis Peak 7100 ft.	800	....	Distillate	.....	.....	.....
Bossier Parish:								
Bellevue	11-13-1921	Nacatoch 375 ft.; Buckrange 1000 ft.; Glen Rose	850	110	578	9,501,130	11,200	218,870
Carterville	12- 7-1926	Buckrange 3085 ft.; Tokio 3170 ft.	1,500	51	280	2,530,417	1,700	1,269,583
Elm Grove	1916	Nacatoch 800-900 ft.; Buckrange 1700 ft.; Tokio 2400 ft.; Trinity 4400 ft. in Jan., 1923	1,225	35	315	3,213,698	2,620	986,302
Sligo	1922	Nacatoch 850 ft.; Buckrange 1725 ft.; Tokio 2450 ft.; Oil in Basal Glenn Rose 5100-5200 ft. in 1936	900	12	279	145,345	161	1,004,655
Caddo County:								
Blanchard (Longwood)	1927	Nacatoch 900 ft.; Tokio 2200 ft.; Travis Peak 5900 ft.	.....	....	Gas	.....	.....	.....
Caddo District	3-28-1906	Nacatoch 1000 ft.; Buckrange 1825 ft.; Tokio 2250 ft.; Trinity 3650 ft.	60,000	1,200	7,491	145,548,000	2,400	30,420,000
‡Rodessa	7- 7-1930	Three zones in Glenn Rose 5900 ft.; Oil found in July, 1935	11,400	446	43,340	38,000,000	3,330	119,000,000
Claiborne Parish:								
Haynesville	3- -1921	Blossom 2700-2800 ft.; Glenn Rose 4600 ft.	5,200	310	3,000	66,417,800	12,900	38,182,000
Homer	1- -1919	Blossom 2850 ft.; Buckrange 2000 ft. in 1923	2,500	335	2,386	65,889,900	26,380	36,610,100
Lisbon	12-25-1936	Pettitt lime (basal Glenn Rose) 5300-5400 ft.	4,000	173	10,000	2,275,000	568	13,725,000
Sugar Creek	1930	Glenn Rose 4000 ft.; Travis Peak 5600-5700 ft. in 1936	160	3 Oil	315	95,405	596	4,304,595
De Soto Parish:								
Grogan (Ramsey)	7- 4-1937	Paluxy 2960 ft.	.....	1	50	15,320	.....	.....
Holly	11- 3-1930	Woodbine 2860 ft.	220	8	118	816,820	3,700	80,000
East Carroll Parish:								
Epps (Floyd)	1928	Chalk Rock 2350 ft.	.....	....	Gas	.....	.....	.....
La Salle Parish:								
Urania	3-25-1925	Cane River 1525 ft.	3,300	257	3,200	21,358,050	6,450	6,641,950
Lincoln Parish:								
Montcalm	11-26-1935	Glen Rose 5300 ft.; Travis Peak 6575 ft. in 1936	.....	Shut in	Distillate	.....	.....	.....
Ruston	1937	Glen Rose 5800 ft.; Travis Peak 6570 ft.	100	....	Distillate	.....	.....	.....
Red River Parish:								
Red River (Bull Bayou)	1912	Nacatoch, Chalk, Tokio, Glen Rose 790-3575 ft.	5,000	158	1,428	55,220,310	11,040	9,000,000
Richland Parish:								
Richland	12- 1-1926	Tokio and Eubanks 2400 ft.	21,000	96	18 M. gas	.....	.....	.....
Sabine Parish:								
Converse	10- 4-1932	Nocatoch, Chalk cretaceous 1500-3400 ft.	1,610	82	640	1,621,505	1,005	3,403,495
Pleasant Hill	2- 3-1927	Washita 3200 ft.	580	26	110	424,535	732	149,465
Zwolle	11-28-1929	Nacatoch & Marl 2260-2500 ft.	60,000	66	870	12,992,500	218	5,399,500
Union Parish:								
Monroe	1916	Chalk Series 2100-2300 ft.	260,000	1,145	565 M. gas	.....	.....	.....
Webster Parish:								
Cotton Valley	8-22-1922	Blossom 2550 ft.; Glenn Rose 4200 ft.; Travis Peak 5500 ft.; Lower Marine 8100 ft., distillate.	2,500	106	4,100	15,538,650	6,218	47,461,650
Shongaloo	10- -1920	Blossom 2750 ft.	140	....	Shut in	107,880	770	.....
Sibley	1936	Glenn Rose 5500-5600 ft.	.....	....	.....	.....	.....	.....
†Total	.....	.....	162,685	3,380	78,500	441,287,720	.....	317,707,900

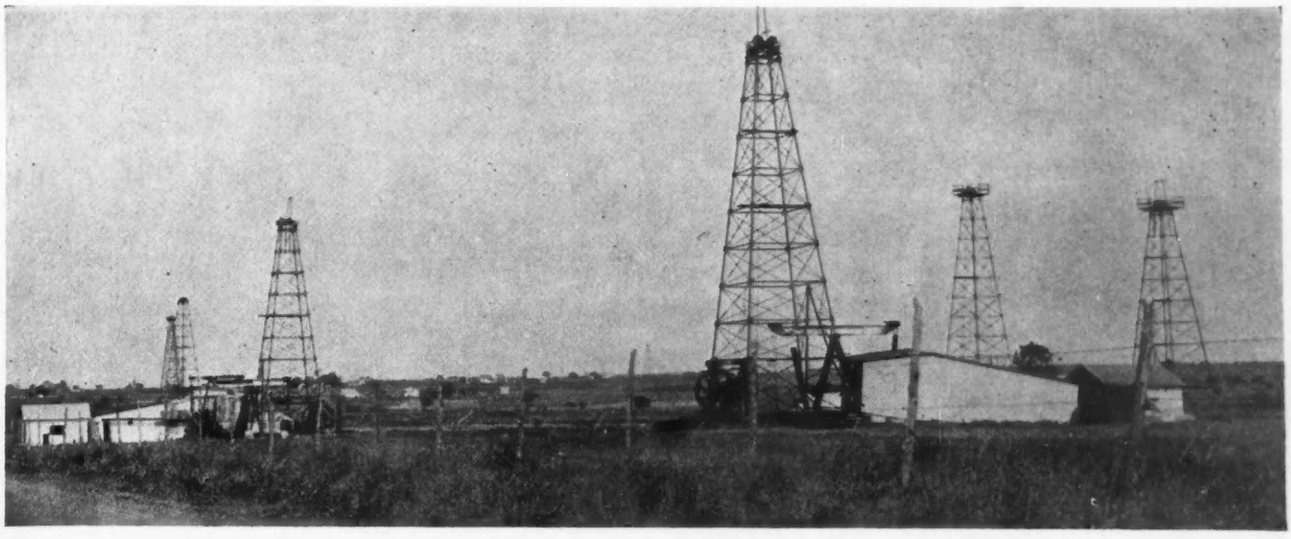
* Estimates of unproduced reserves includes only that volume discovered, and makes no attempt to include probable future discoveries.
† Totals include only oil producing area, being exclusive of strictly natural gas acres.
‡ Rodessa extends into both Arkansas and Texas, which gives it a total of 22,400 proven acres, 831 wells. The total Rodessa Cumulative Production is 55,136,000 barrels of oil, and it is expected to produce 240,000,000 barrels in the future.

HISTORY OF

East Texas

Home of Texas' first oil development, of famed Balcones fault fields and East Texas — world's largest — now looks toward deeper prospecting

By GRADY TRIPLETT
Staff Writer



First of the great Balcones fault fields was Mexia, shown here as it appears today with its pumping wells.

TO East Texas goes credit for the first oil development west of the Mississippi river. At Oil Spring, Nacogdoches County, wells were drilled in 1866 with oil as the objective and oil as the result, for a well flowed 30 barrels daily there from 100 feet. It was a play that died out for lack of market and the record of development has been handed down through written references but without definite dates and no accurate depth records.

Again in 1877 there was oil development near the town of Nacogdoches and this reached such proportions that a pipe line was built to the city. This field has had spasmodic development since then and the latest venture there was digging shafts for mining the shallow oil bearing sand.

Corsicana Started It

But the field which gave oil development in Texas its impetus was Corsicana, where a municipal water well venture drilled into an oil bearing sand at 1035 feet in 1894. The oil was cased off and the water well completed at 2480 feet. Later, however, oil appeared around the casing of the water well and this was the cause of the oil development.

Ralph Beaton, H. G. Damon, John Davidson started their drilling for oil the next year and completed it October 15, 1895, for only five barrels daily. From this came the development of the Corsicana field.

Development of oil at Corsicana was significant from several viewpoints. It brought the first substantial collection of capital into Texas for oil purposes, the first refinery and application of the rotary drilling method into oil well drilling. Although Corsicana did not produce the first oil west of the Mississippi river, it was there that oil development took its first foothold and the industry literally had its beginning, for the Southwest, at Corsicana.

The vagaries of oil field development can be appreciated by the fact

that it was 30 years later before another large oil field came along to start the East Texas area into the dominant position it now holds in petroleum.

November 11, 1920, is the completion date of Rogers 1, drilled by Colonel A. E. Humphreys to open the Mexia field, first of the great Balcones fault fields. Its development got under way in 1921 with the result that Mexia has produced 95,279,414 barrels of oil from 3720 acres and still produces 700,000 barrels a year.

Next along the Balcones fault was the Powell field, discovered January 7, 1923. Powell from 2656 acres has produced 118,016,087 barrels of oil.

Another fault line pool of consequence was Wortham, discovered November 11, 1924, which was confined to 715 acres.

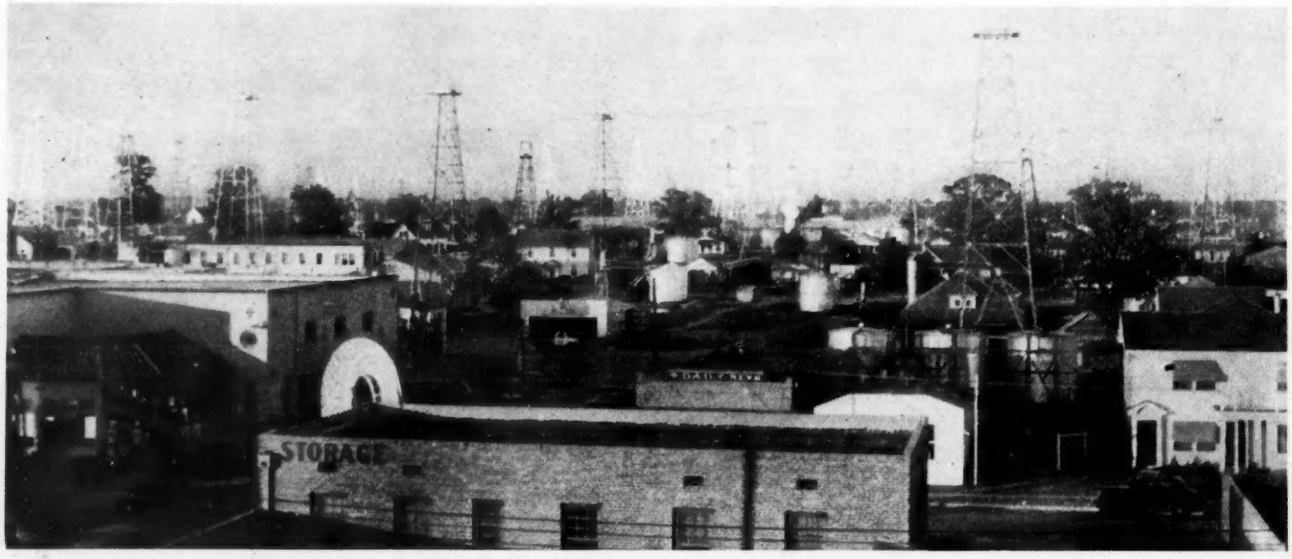
hope a discovery such as took place October 3, 1930.

For three years C. M. Joiner had carried on a drilling campaign that drew scant attention. His first hole on the Bradford farm, Juan Ximinex Survey, Rusk County, was lost at 1290 feet. His second hole on the same farm was lost at 2546 feet. By September 5, 1930, the third hole recorded a broken sand between 3536 and 3592 feet and a drill stem test resulted in "a brief flow of oil."

Geological information was not favorable to the area. Besides, the petroleum industry was wrestling with proration, since the Greater Seminole area and the Oklahoma City field were playing hob with the economic structure of the industry. After a year of falling stock market quotations the impression was gaining that a depression was something more

five counties. In its more than seven years of development it has broken most of the records of oil and is still shooting at those not broken. It has 24,747 producing wells, one fifth of which are pumping. It has an hourly potential rating of 14,863,792 barrels. It produces 500,000 barrels daily and had produced up to January 1, 1938, 1,158,500,000 barrels of oil for the record and a lot more that never got on the record.

Later oil discoveries in the East Texas area include Talco and Sulphur Bluff, Flag Lake and Grapeland. A development of 1937 of little significance on the score of oil produced but of consequence in that oil was found within the Trinity group was Opelika in Henderson County. In one well, McElreath-Suggett 1-C, Tide Water Associated Oil Company and associates found the upper Glen



Most famous of all fields—East Texas —world's largest in area, number of wells and production.

These fields, as well as other minor strikes were of double significance. They established the fault as an excellent trap for oil accumulation; they proved the Woodbine sand as an outstanding formation for oil, once a desirable trap is found. From these facts came the encouragement to move into the East Texas Basin in search of other types of structure.

Basin Region in 1929

First of these was the Van field, Van Zandt County, discovered October 14, 1929. Van has had the advantage of unit development, as the acreage of five concerns was pooled early in its development and its recovery has passed 110,000,000 barrels. Thus the East Texas basin became a favored spot for wildcatting but neither the industry nor the owners of its farms had in mind or in

than a flurry. All in all the drill stem test on a wildcat well down in Rusk County did not cause great excitement. More than 50 East Texas wildcats had been abandoned since the Van strike, 40 miles northwest.

A lot of lease trading had to be done before pipe could be provided to set the 6⅝-inch casing at 3488 feet and it was October 3, 1930, when the Daisy Bradford No. 3 made a flow over the derrick and was credited with 300 barrels initial. A cryptic prediction in THE OIL WEEKLY of October 10, 1930, was "probably a half dozen tests will be drilling in the Joiner area within 30 days."

Such was the beginning of the East Texas oil field, whose area is now 133,000 acres, spread over parts of

Rose to be oil bearing at 7195 feet and the lower Glen Rose to be oil bearing at 7950 feet.

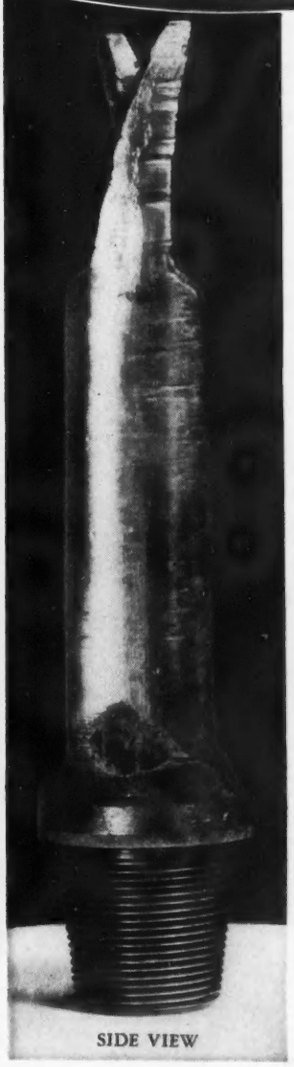
Deeper Drilling Prospects

Although the Woodbine sand still offers encouragement as an oil producing formation over the area, its future likely will be marked by drilling to the lower beds of the Trinity group, since these have been found productive in the Rodessa pool, which extends into Cass County, Texas. Arkansas recently has uncovered production in rocks of Permian age, which should be within drill depth over the larger part of the East Texas basin.

A pictorial and descriptive article of the East Texas field's geology, history, area and operating problems and practices is presented on succeeding pages.

One Haystellited Bit *drills 2000-foot Well*

FRONT VIEW



SIDE VIEW

IN a Texas oil field, this 9⅞-inch Haystellited bit recently drilled a 2000-foot well. Yet the bit is still almost as good as new. Before Haystellite was used, 4 to 6 bits were required to drill a well of the same depth in this field.

This and many similar records indicate why bits hard-set with Haystellite Inserts and hard-faced with Tube Haystellite are so widely used all over the world. Results are dependable because these products are of uniformly high quality.

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East Texas

HISTORY

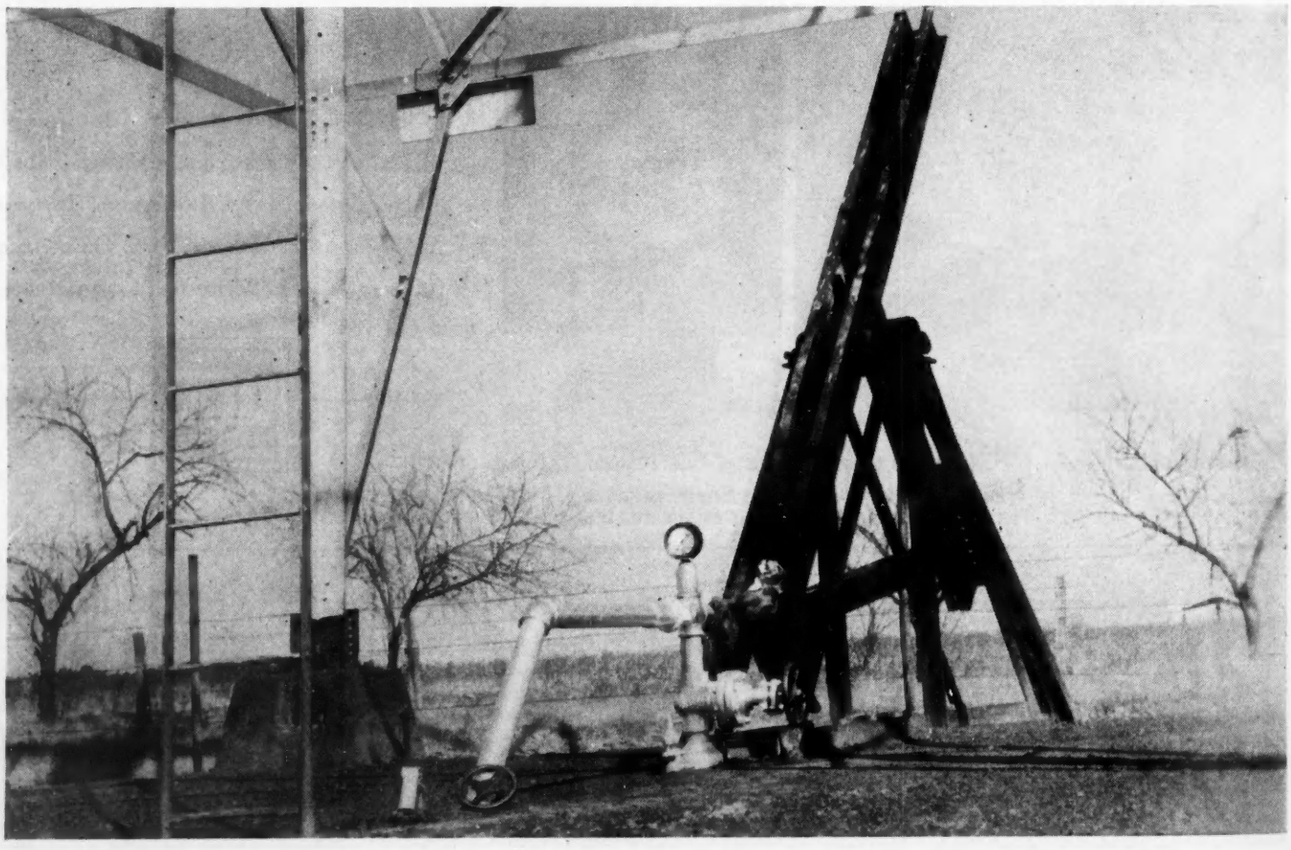
First oil well in the East Texas field was the third venture of C. M. Joiner, Daisy Bradford 3, which made a head over the crown block October 3, 1930, from the Woodbine sand, 3536 to 3592 feet. Two previous holes had been lost and subsequent development of the field revealed that the successful well was but a few locations inside the producing area. A few days previous a favorable drill stem test drew scant attention, since text books had it that the Woodbine sand did not extend that far into the East Texas basin. Since then the text book has been rewritten.

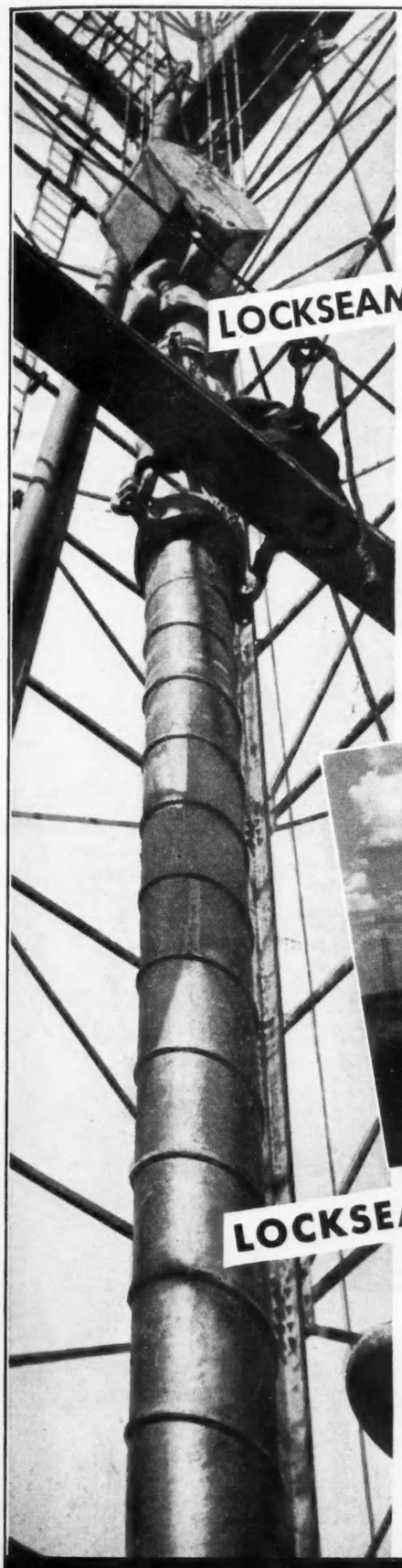
When Ed W. Bateman and associates completed L. D. Crim 1 in the Woodbine sand, 3640 to 3642 feet, flowing 600 barrels in 40 minutes, December 28, 1930, the strike was accepted as opening another pool. This is now the Kilgore area.

By the time J. E. Farrell, W. A. Moncrief, E. A. Showers and the Arkansas Fuel Oil Company had completed Lathrop 1, Woodbine sand, depth 3587 feet, January 26, 1931, the impression was gaining ground that the three wells had tapped a common source of supply. Around this well came the Gladewater area development.

These were the early strikes in a field which now covers 133,000 acres, has 24,747 producing wells, has an hourly potential rating of 14,863,792 barrels, has 80 rigs running, has produced 1,158,500,000 barrels of oil, still produces 500,000 barrels daily and promises to produce another two or three billion barrels.

Such potential rating credits the field with ability to produce 356,731,008 barrels daily. Like other phases of East Texas, potential figures do not tell all the story. Its illegal output (not credited to oil produced) surpasses total output of some substantial oil fields. It is credited with 20 producing wells on one lease of 2.61 acres. It was too big for the industry to digest, as its short time flow of a million barrels a day soon proved. The state government could handle it only by martial law. Control of output was accomplished by passage of the federal statute known as the Connally Act. The one word that describes it is big and it is too big to comprehend.





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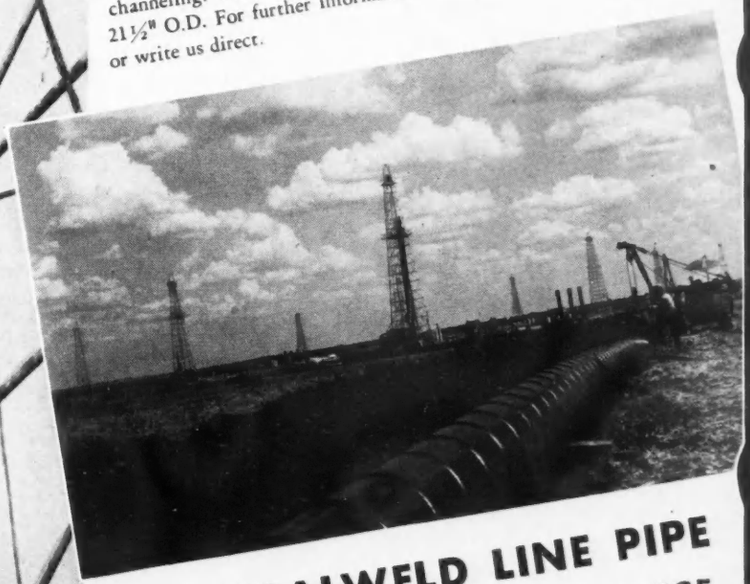

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DRILLING

Light rotary rigs and derricks 96 feet high are sufficient for the quick drilling demanded in East Texas.

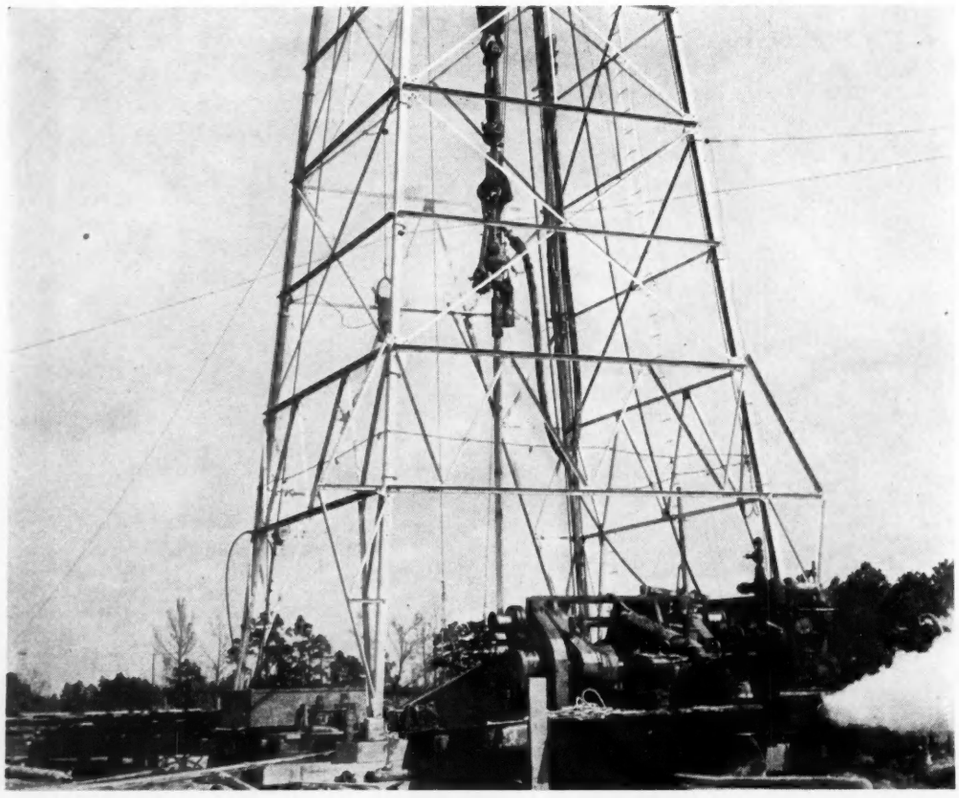
Steam is the universal power with two boilers the accepted hookup. A single engine for drilling and hoisting is sufficient. Two mud pumps are accepted practice although some drilling is done with one pump on the job. Mud is dependent upon the locale of drilling as some surface provides ample mud while others are inadequate, which calls for commercial material.

Wells cost from $8500 to $10,000, depending on the method of completion.

East Texas is a drag bit field. Hard formation bits are limited to penetration of the Pecan and Austin chalks and a few drillers use them for the cap rock above the Woodbine sand.

Drilling time has been steadily reduced until 10 days are ample for completing a well.

Until recently little coring was done. Now some producers are coring the Woodbine section to determine water level so casing may be set and gun perforated.



CASING

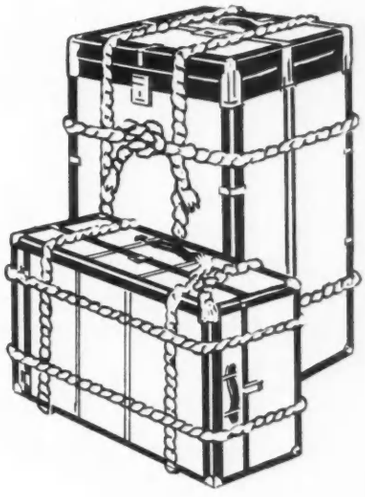
Until recently the casing program for the East Texas field was simple in the extreme. Surface strings, 100 to 125 feet, may be 8-inch, 8⅝-inch or 10-inch. This is cemented to the surface. The oil strings offered more variety in size, with 8-inch the larger and 5-inch the smaller. The oil string is landed on the cap rock above the Woodbine sand and cemented.

Tubing, both 2-inch and 2½-inch, is swung in the hole, after plug is drilled and the sand penetrated.

The recent change in casing program is not universal but some of the major leaseholders are undertaking the fight against water encroachment by drilling into the Woodbine sand, setting the flow string to the bottom of the hole, cementing with as much as 500 sacks and gun perforating for production.

THEY *Won't* UNPACK !

THE LAYNE PACKERS



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Double Seal Packer

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The result is a pack approximately 20 inches long of almost iron hardness.

This extra long contact on the casing eliminates the necessity of fingers or slips to prevent packer from creeping up when exposed to high gas pressure.

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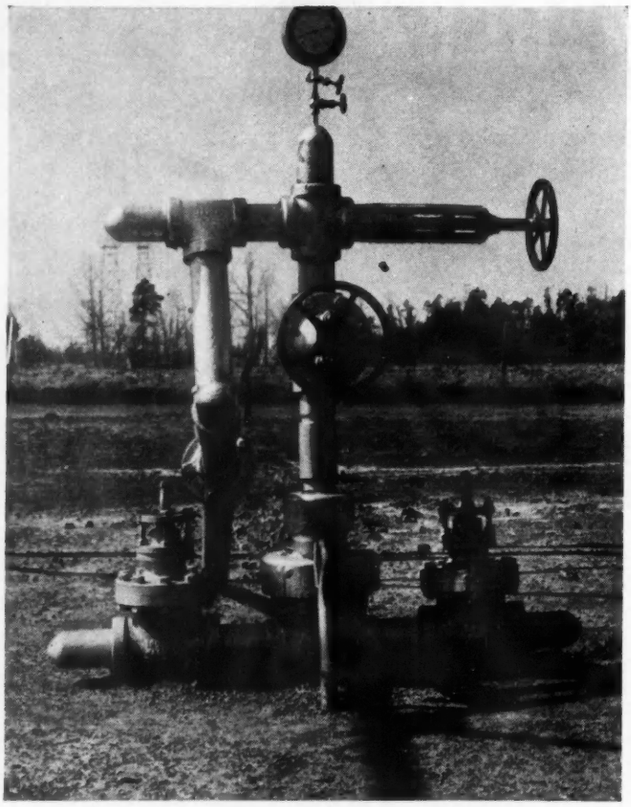
[East Texas Continued]



FLOWING

Low pressure and restricted output allow use of light equipment for Christmas tree installations in East Texas. Valves and fittings of 2000-pound test are adequate.

Designs are in such variety that it is not possible to select one as typical for the field. Several major oil concerns have adopted designs, which are carried out for company wells.

Minimum equipment for an East Texas Christmas tree is, a tubing head, master flowing valve, flow bean and pressure gauge. Few are restricted to such simple design, as necessity of cleaning, ease of dissembly, method of burying flow line and appearance bring additional valves and fittings into most flowing assemblies in East Texas.

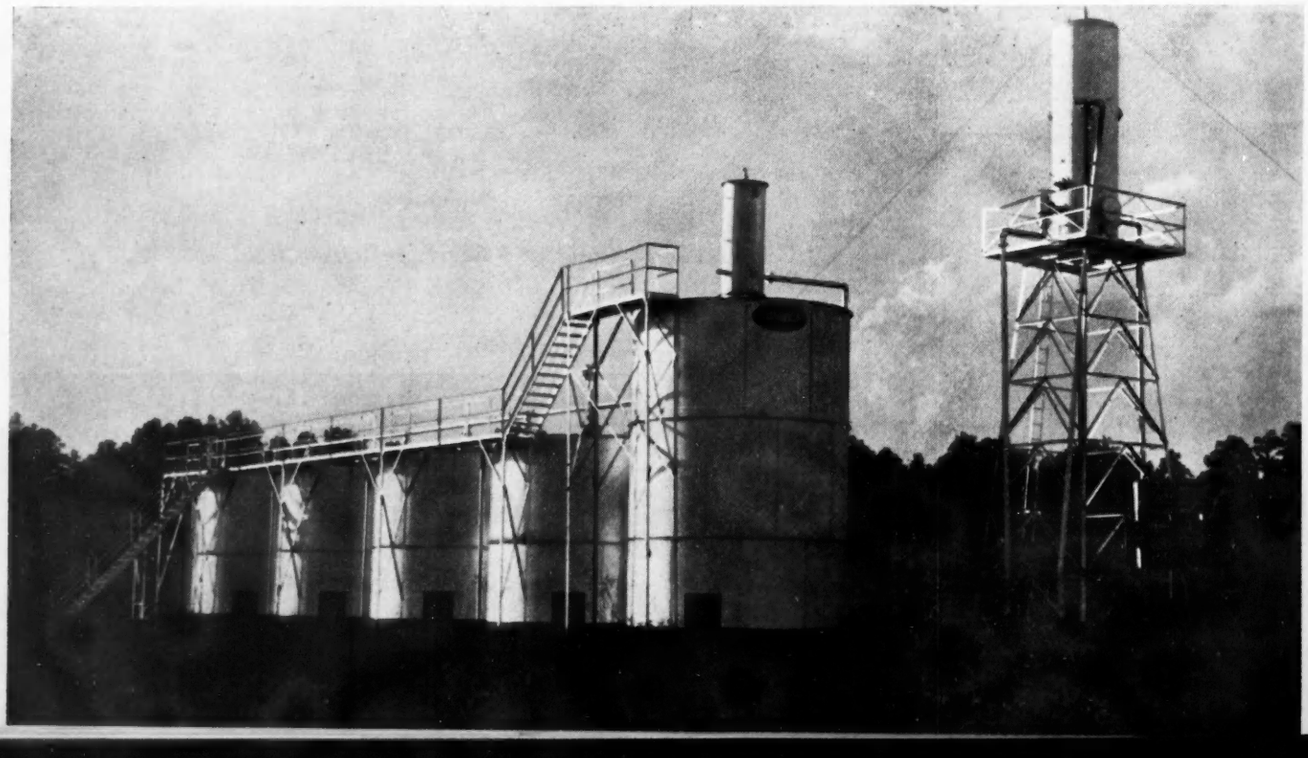
Design of well head flowing equipment is also influenced by the necessity of shifting to pumping. Hundreds of flowing wells have concrete bases poured for installation of pumping units. In these cases flowing design is such that heads for pumping may be easily installed. Four fifths of the wells in East Texas are still flowing.

TANKAGE

Tankage in East Texas is arranged for lease basis storage. Maximum well output of 20 barrels daily allows one separator to take care of all wells, while two to six flow tanks are sufficient for handling lease output during periods between pipe line deliveries.

Common practice is to elevate the separator and tanks frequently have foundations below the surface.

Leases whose wells make water (still not a major problem in the field) separate water from oil by both gravity and chemical treatment. Water is pumped through field disposal systems.



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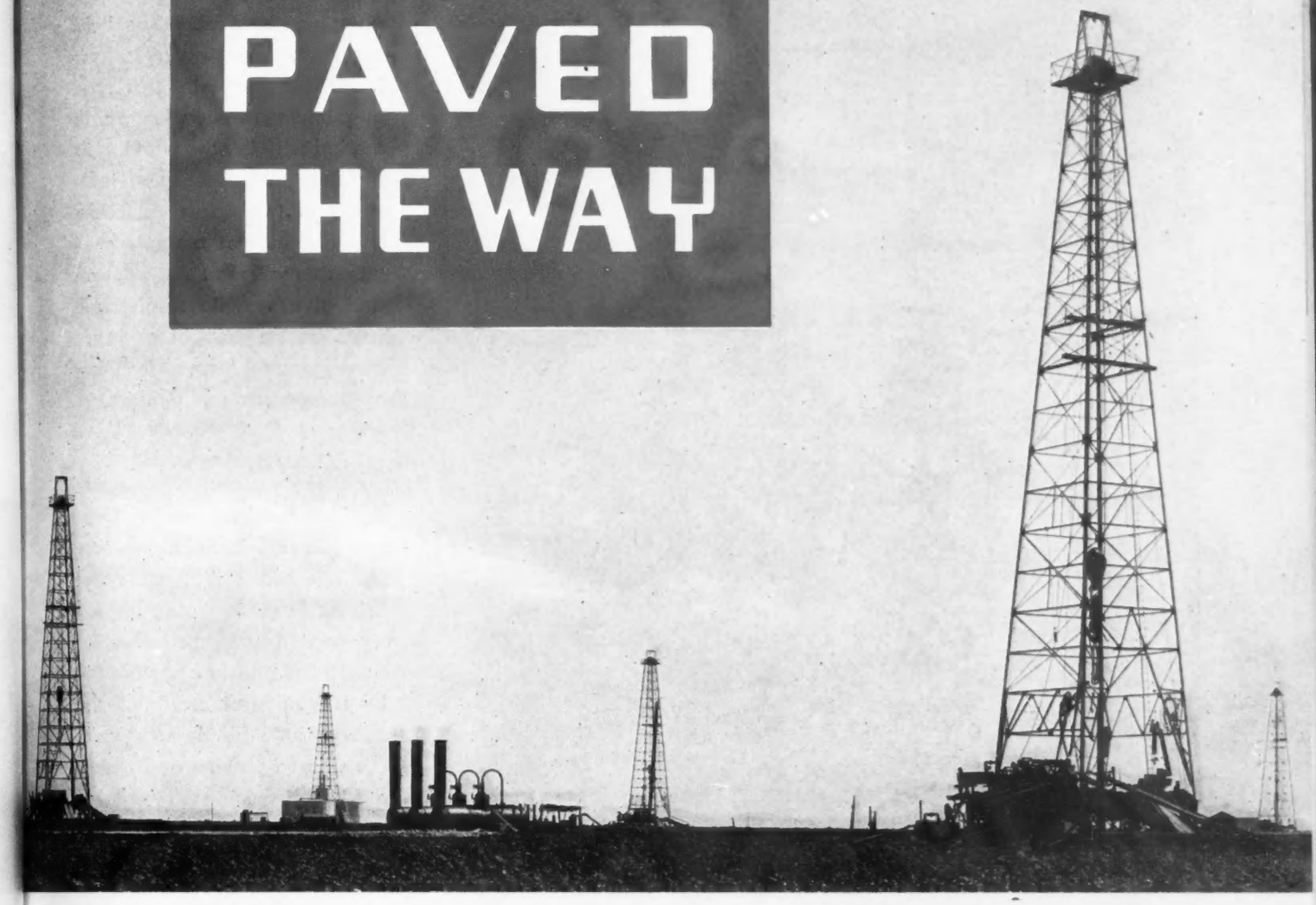

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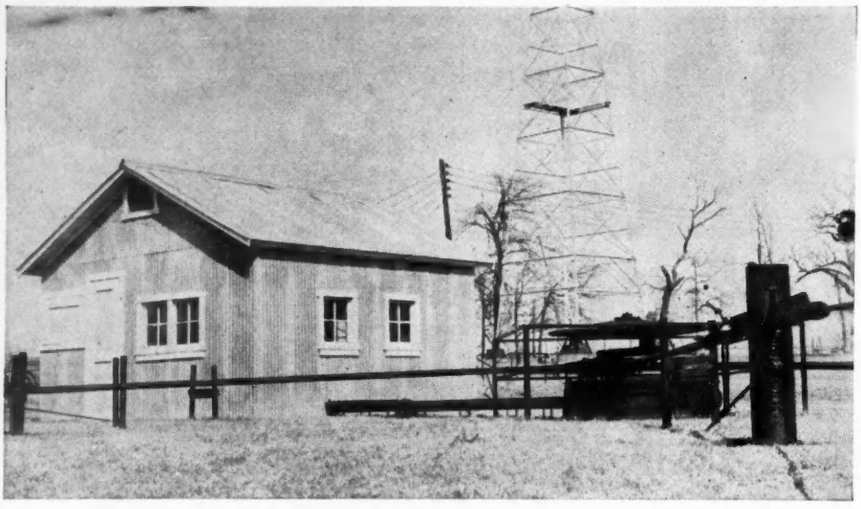

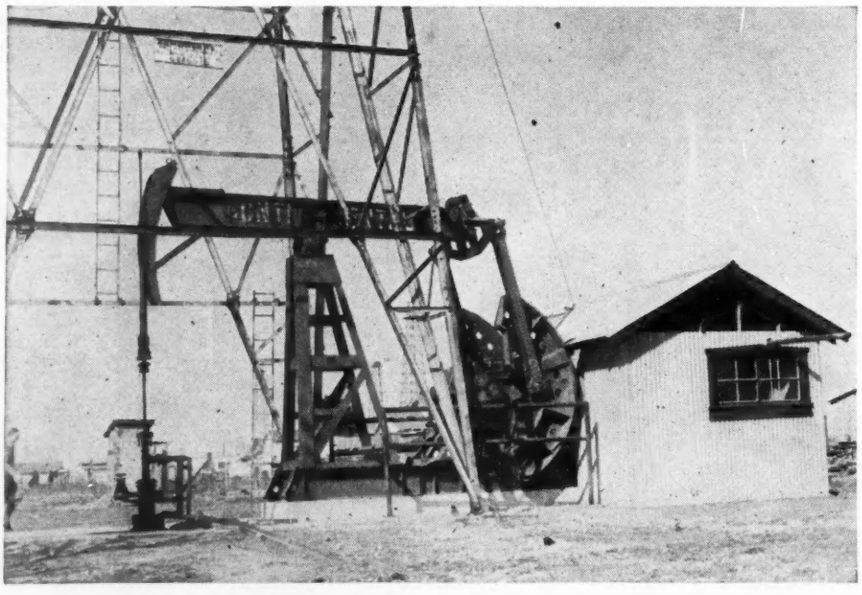

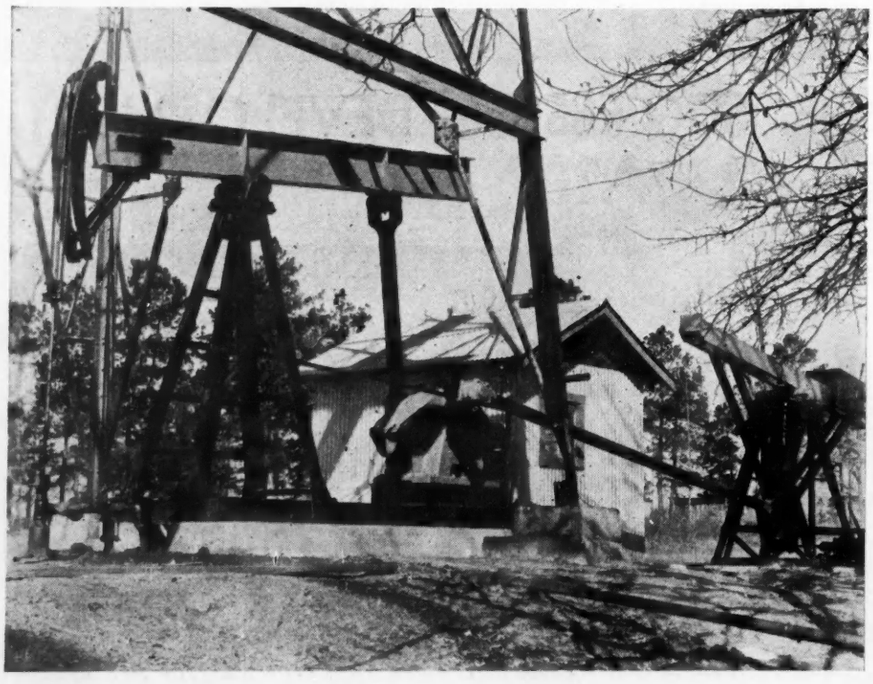

PUMPING

With one-fifth of its wells now pumping the East Texas field is giving the answer as to how it will be pumped. Each type of pumping device known to the industry is now working in the field and these give indication that pumping will follow a cycle, in that multiple well pumping will start the program and give way to single well units as the amount of water increases and forces the lifting of greater amounts of fluid per well.

Both gas engines and electric motors are used for power. Central power installations are both geared and band wheel driven. Multiple well pumping by geared units provides for two, three and four well lifting by use of back crank off the geared unit. Single well units are geared powers and standard rigs. By using power take-off as many as six wells are pumping by one prime mover.

Lease location as to structure and well density are factors in determining pumping equipment. Edge wells, already making water, are usually equipped with single well units, as are wells in the closely drilled areas where flowing ceased comparatively early. Wells not now making water but in line for it are pumping in multiple so single well units can be used when need arises. In more favorable areas central powers will be used as conditions promise long pumping life with minimum water trouble.

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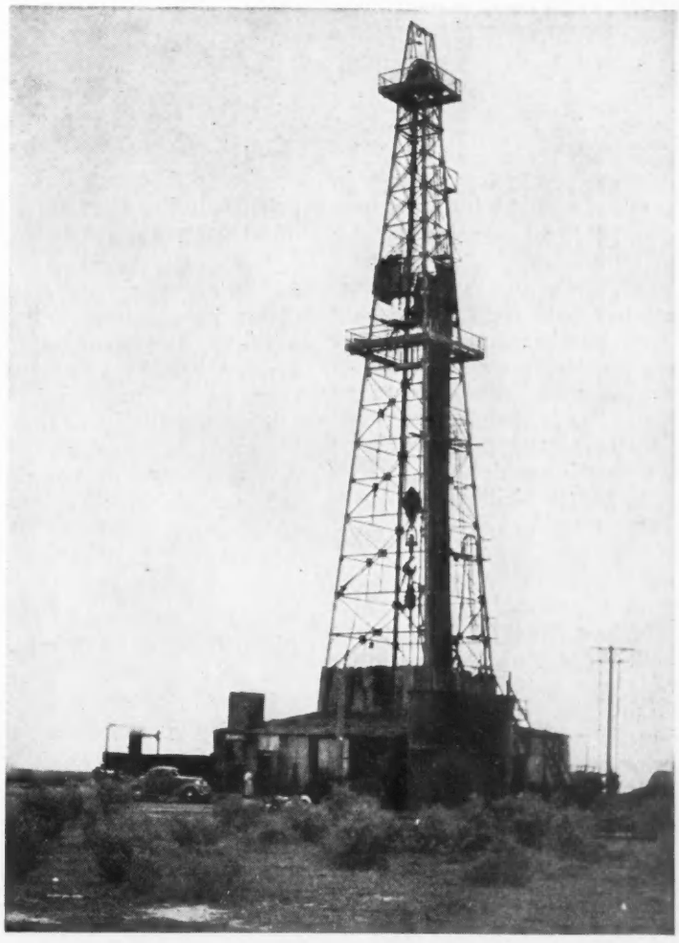

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East Texas

Well Density

Present average of 5.37 acres per well to be further reduced by sustained drilling; major firms lagging behind independents

By H. H. KING, Staff Writer

FOURTEEN majors control 59.86 percent of the producing acreage in the East Texas field but are producing only 52.14 percent of the current allowable due to having failed to maintain average well density on a par with the approximate 1075 other participants. The large interests have been striving to iron out this inequality by continuous development of inside locations. The miscellaneous group have been equally aggresive in defending their advantage by the drilling of a proportionate number of additional wells.

Adoption of the well potential method of apportioning allowables in this field on April 24, 1933, when 9913 wells were prorated to 15 percent of their rated hourly flow, placed a premium on the close spacing of wells on a given tract. The production advantage has remained in effect since the factor was lowered June 21, 1936, to 2.32 percent, or the approximate minimum level possible with a marginal allowable of 20 barrels daily per well.

Independents are credited with 53,388 acres of the estimated 133,000 acres of productive territory, and have an average density of 4.51 acres per well as compared to 6.17 acres per well for majors. The field has been drilled to a density of 5.37 acres. It is certain to go below 5 acres per well, since development this year is being carried on more extensively than the same period last year.

Total of 4740 additional wells would be required by the majors to place their density on a par with the miscellaneous operators. This will never be accomplished, as the minority acreage owners are operating more than 50 percent of the 60 rigs currently in service and have a greater number of approved locations slated for drilling.

Average well density of majors ranges from a minimum of 5.16 acres to a maximum of 8.48 acres. Only two concerns having more than 1000 wells average less than 6 acres per well. The same number have a greater percentage of the total production than acreage.

Liberal stand taken by the Railroad Commission in granting exceptions to the well spacing rule has been abused by the majority of the operators. Well density on numerous properties beyond the townsite areas has been carried to the extreme, such as 22 wells on a 21.62-acre tract and 12 wells on 3.33 acres. Scores of tracts, bearing more than one producer, have a density of a fraction of an acre per well.

Property owners that have failed to maintain equal well density with offset tracts are exposed to oil drainage. Majority of the large interests and numerous independents that subscribe to a reasonable well spacing plan have waged unsuccessful court action to check excessive drilling. The issue involves millions of barrels of oil.

Fourteen majors stand to lose approximately 154,000,000 barrels of the estimated 2,000,000,000 barrels of oil remaining in the reservoir by reason of having a deficit of 7.72 percent on allowable production through having failed to keep abreast of the miscellaneous group in well density.

COMPANY	Productive Acres	Total Wells	Average Acres per Well	Approx. Daily Allowable	Percent of Total Acreage	Percent of Total Prod.
Humble Oil & Refining Company	14,745	2,403	6.13	48,613	11.09	9.71
Gulf Oil Corporation	8,790	1,371	6.41	27,735	6.61	5.54
Atlantic Refining Company	6,788	1,266	5.36	25,611	5.10	5.12
Magnolia Petroleum Company	7,082	1,235	5.73	24,984	5.32	4.99
Stanolind Oil & Gas Company	7,390	1,156	6.39	23,386	5.56	4.67
Sinclair Prairie Oil Company	6,783	1,024	6.62	20,716	5.10	4.14
Sun Oil Company	5,914	893	6.62	18,065	4.45	3.61
Tide Water Associated Oil Company	5,031	869	5.79	17,580	3.78	3.51
Shell Petroleum Corporation	4,076	790	5.16	15,982	3.06	3.19
Ohio Oil Company	4,987	588	8.48	11,895	3.75	2.37
Arkansas Fuel Oil Company	2,996	532	5.63	10,762	2.25	2.15
The Texas Company	3,341	488	6.85	9,872	2.51	1.97
Cities Service Oil Company	1,331	241	5.52	4,875	1 00	.97
Continental Oil Company	358	46	7.78	931	.27	.19
Total for 14 majors	79,612	12,902	6.17	261,007	59.86	52.14
Miscellaneous operators	53,388	11,845	4.51	239,624	40.14	47.86
Field totals	133,000	24,747	5.37	500,631*	100.00	100.00

* Daily allowable for 6-day week, and 2,428 barrels to be deducted for 120 accounted for dead wells.

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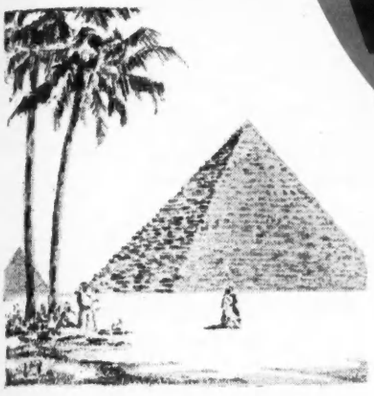

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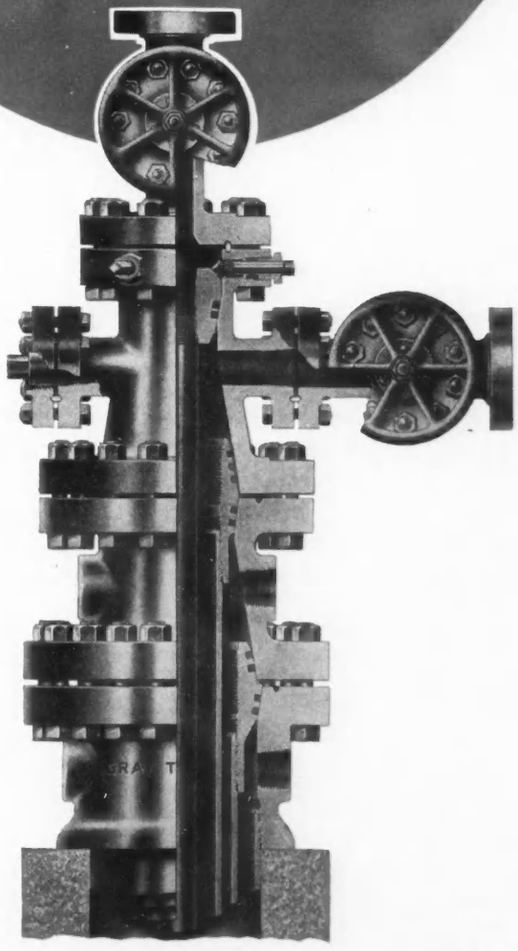
Gray Systems are built to withstand ravages of the elements. We build into them the best materials, by the best workmen, from designs based on hundreds of well control studies; made in cooperation with men actually engaged in drilling and producing wells.



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GRAY TOOL COMPANY

HOUSTON — TEXAS

East Texas Basin

Deep Possibilities

Although sparsely explored, sufficient results have been found in deep tests to encourage exploration of the Lower Trinity and Marine geological formations

By H. H. KING, Staff Writer

THE next widespread lease play and exploratory drilling in the East Texas Woodbine basin will be directed at the lower Trinity and Marine geological formations. These sparsely explored deep zones have yielded sufficient oil, gas and distillate to justify a prediction that the basin will stage a comeback as has been the case with North Louisiana and South Arkansas fields. The latter have experienced a leasing boom and an aggressive deep drilling program in recent months without as much preliminary encouragement as the Woodbine basin affords.

Performance of the lower Trinity series in the Rodessa field, situated on the Louisiana-Texas-Arkansas border; Jefferson field, Marion County, Texas, and at scattered points in North Louisiana and southern Arkansas establishes the deep zones as being worthwhile objectives. The lower Marine has not been explored and developed sufficiently in East Texas to be rated as a major source of oil and gas, but it is conceded to offer important possibilities.

These deep producing horizons in the Ark-La-Tex district prevail throughout a greater portion of the Woodbine basin, but production is confined to the Trinity series. Only two tests have been drilled through the lower Marine in the Woodbine basin, and one of these sustained a junked hole in the Reynolds lime. The other is plugging back by stages and testing nominal oil and gas showings logged in the top portion of the Marine after yielding salt water in the Reynolds lime.

Nearest lower Marine production to the Woodbine belt was uncovered last year near Cartage, Panola County, by Magnolia Petroleum Company's E. A. Hull 2, which showed high-pressure gas and distillate from tight sand at 8686-8718 feet. Top of Marine was called at 8075 feet. Hole was junked while trying to run 5-3/16-inch casing. However, it was plugged back to 5950 feet, where it produced 2,420,000 cubic feet of gas and 80 barrels of distillate initial from lower Glen Rose, or the equivalent of the Rodessa pays. Closed-in pressure on casing was 2275 pounds, and working pressure on tubing 2225 pounds.

Fault Area Search

Search for deep production under the Mexia field gave the Woodbine belt its first lower Trinity test. This project was drilled by E. L. Smith Oil Company et al on the Jake Steubenrauch tract, and blew in as a gasser May, 1937, after drilling to 5732 feet. Hole was partially junked while trying to land 6¼-inch pipe for a production test, which was never completed, although the well produced a maximum of 12,000,000 cubic feet of gas daily. The well later produced a small volume of high gravity oil daily by heads. Full details on the performance of this original deep producer for the basin is given under the Mexia field (deep) listing. Encouraged by this showing, C. F. Lytle et al later drilled two failures to the Travis Peak, and in 1935 Peyton Bros. et al encountered free oil and small volume of gas from the lower Glen Rose. Pure Oil Company's Kendrick 16-T, situated 1700 feet east of the Woodbine fault, also failed to produce from the lower Trinity, and was bottomed in Reynolds lime at 8763-8847 feet when drill pipe stuck. Hole was plugged back above the lost stem, and tested salt water in the Travis Peak and lower Glen Rose.

The Mexia faulted structure is rated as an attractive deep prospect in spite of the disappointments. Peyton Bros., C. F. Lytle et al have assembled deep rights on 3000 acres, and are contracted to spud a lower Trinity test by June 1 on the Steubenrauch tract. Seismograph surveys and subsurface geology have been combined in selecting the drilling site.

Deepest penetration of the geological section in the basin was terminated March 10, 1938, when Stanolind Oil & Gas Company and Ramsey Petroleum Corporation's T. Norris 1, Thornton faulted structure, Limestone County, quit in conglomerate at 9951½ feet. The Thornton fault has been rated as one of the best deep prospects along the Mexia fault series, as it affords greater closure. Norris 1 is currently plugging back by stages

MacCLATCHIE TOOLS

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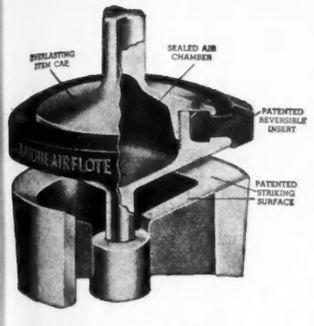
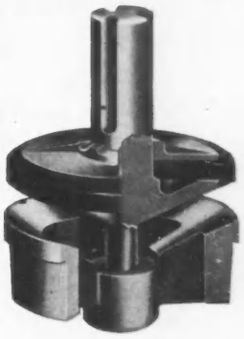


The New MacClatchie AIRFLOTE MUD PUMP VALVE

The Airflote is a fundamentally new type of valve engineered for today's deep wells and high circulating pressures. A built-in sealed air chamber gives greater buoyancy, less fluid slippage, more efficient valve action and greatly reduced impact. In air the valve is approximately 20% lighter than other types of the same corresponding size. The reduced weight improves the efficiency and life of the valve by reducing destructive hammering and increasing the sensitivity of the valve to slight changes in fluid movements. Write us for remarkable records this valve is making.

The air chamber is sealed with a large diameter tool joint thread that shoulders to give great strength and rigidity and prevents it from leaking or unscrewing in service. The valve has only three parts—valve body, cap and insert. As there is practically no wear on the cap it can be used over and over again, giving longer life and cutting the maintenance cost. The Airflote also has reversible Inserts. Valve seats for the Airflote and the Streamlined are interchangeable.

The MacClatchie STREAMLINED MUD PUMP VALVE



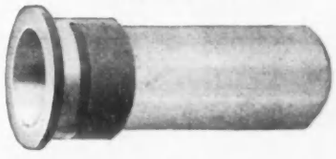
MacClatchie Streamlined Valves are recognized as the standard of the industry. Their streamlined construction gives unobstructed fluid flow entirely free of lodging areas to collect and impair the proper closing of the valve. All of the cross bar and a large part of the seat form a streamlined striking surface. This large metal striking surface — 40% greater than ordinary valves — absorbs the entire blow of the valve and assures longer life without hammered out spots to throw valve out of alignment.

The patented valve rubbers are reversible, giving double life to every rubber.

WEAREVER PUMP PISTONS

These engineered pistons give superior service because their patented construction prevents any steel from contacting the liner. Patented liner protectors—"L" shaped brass rings vulcanized securely to the rubbers—overlie the steel center of the piston and protect both liner and piston from excessive wear. Moreover, the rubbers on MacClatchie Wear-Ever Pump Pistons are replaceable at the well without changing the center spool or end plates. This feature effects a tremendous saving over one piece pistons. The cost of replacement rubbers is but a fraction of the cost of a complete piston as the steel parts will last indefinitely.

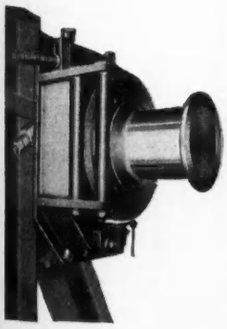
MONEY SAVER PUMP LINER



Made of selected seamless alloy steel tubing, hardened by a special heat-treating process and ground to a mirror finish, MacClatchie "Money-Saver" Pump Liners are absolutely uniform in their extreme hardness, and have **no soft spots to hasten breakdown of the liner.** Although they sell for about half the price of ordinary forged steel liners, they have consistently outrun costly spun metal liners . . . conclusive proof of their superiority! And check this — the wear-free gland can be quickly slipped off a worn liner and used over and over again. Thus you pay only the cost of the **liner itself** (without glands) when renewing MacClatchie "Money-Savers." Uniform wall thickness is maintained on all size liners. This weight reduction is very important on reduced sizes particularly where transportation cost is a factor.

SPECIAL TAPER RODS

These scientifically designed rods are made of ball-race steel and heat treated to extreme hardness. They have just the right amount of taper to stay tight under highest pressures and sufficient contact area to prevent them from pushing into the piston. They will not freeze and can be readily removed when desired. The patented "Elastic Stop Nut" insures a rigid grip, an effective fluid seal and the correct amount of metal contact to withstand the severe strain of high pressure drilling. MacClatchie Piston Rods are also furnished in standard equipment taper and universal **taper.**



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A patented gear arrangement enables the Gearomatic Cathead to rotate at half the line shaft speed, yet give double the power. It breaks the tightest joints with ease and without damage to tongs, tong dies, or other equipment. A positive kick-out and slow motion insure greater safety. The positive kick-out permits one revolution and only one, per pull. Consequently, there is no danger of fouled lines injuring workmen or damaging rig equipment.

HYDRO-SEAL PLUG VALVES

Grease-expanded lips spread evenly against the walls of the body insure an absolutely pressure-tight seal. A simple turn of the grease screw maintains the seal and completely lubricates the entire plug — a further check against leakage. In the high pressure models easy turning is assured under ALL conditions by the elimination of compressible packing and the use of ball bearings to carry the thrust load.

A complete range of sizes is available in screw, flanged or union ends . . . hand or gear operated . . . and for working pressures from 250 to 3,000 pounds.

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and testing minor evidence of oil and gas in the Marine and lower Trinity section. This wildcat logged 470-foot section of the Reyonlds lime, followed by 790 feet of virtually solid salt beds. No other test in the basin has drilled through same.

Deep Search in Basin

Development of prolific gas and distillate production from the lower Trinity at Cayuga and Opelika are the outstanding deep strikes in the basin. Tide Water Associated Oil Company and Seaboard Oil Corporation, co-discoverers of the Woodbine oil and gas production at Cayuga, completed N. N. Wills 21-A, near the apex of the Cayuga dome, rated at 150 barrels of distillate and 6,800,000 cubic feet of gas initial on ½-inch tubing choke from lower Glen Rose after plugging off water in Travis Peak section at 7991-9085 feet. The partnership lated moved 7000 feet southwest and completed Fee (J. N. Edens) 15 for the same type of well in the lower Glen Rose. However, the west flank of Cayuga failed to register a commercial oil producer when Roeser & Pendleton, Inc.'s Bowyer 3 tested free oil in lower Glen Rose at a total depth of 7570 feet.

Discoverers of the Cayuga deep wells have experienced a profitable return on the investment through having a 20-year gas sales contract with Lone Star Gas Company that permits reasonable volume of gas withdrawals, and no proration is applied to the high gravity distillate that accompanies the gas yield. Their deep efforts on the Long Lake dome, Anderson County, were negative, and Monnig Bros. 7 was pronounced a failure after coring 41 feet into the Travis Peak section to a total depth of 9971 feet. The latter is the deepest hole in the basin.

Opelika geophysical prospect, northeastern Henderson County, injected new interest in deep explorations last May when Tide Water Associated Oil Company, Seaboard Oil Corporation and Humble Oil & Refining Company's McElreath-Suggett 1 drilled stray oil and gas formation at 7185-95 feet, situated between the first anhydrite stringer and massive beds. Drill pipe froze when pulled 35 feet off the bottom, and was never recovered. Well flowed partially out of control for several days while contractor's crews tried to kill the oil and gas flow. Hole was uncased below 1772 feet. Owners elected to cement stem in place rather than to risk a crater, and the well was completed flowing 10 barrels oil daily by heads through partially clogged openings in large bit. Rig was skidded 880 feet to the southeast for a second test, which logged minor oil and gas showings in the discovery pay. Hole was carried to water in Travis Peak 9073-9320 feet, then plugged back to gun-perforate casing, resulting in the largest deep gas and distillate producer in the basin. Opelika discoverers are grouping short term leases into units for the purpose of carrying on exploratory work. Since no market is available for the Opelika gas production, owners are unable to realize on their investment. Distillate yield of the second producer would amortize the development costs to date if the gas could be disposed of.

Condensed Log of Important Lower Trinity Tests drilled in the East Texas Woodbine Basin

	Survey Elev.	Top Georgetown Lime	Paluxy Series	Upper Glen Rose	Top First Anhydrite	Massive Anhydrite	Lower Glen Rose	Top Pettit	Travis Peak Series	Lower Marine Series	Reynolds Lime
ANDERSON COUNTY—											
Blackfoot:											
T. F. Hunter, American Liberty et al's G. E. Gage 1	384	5681	6758-7029	7029-8085	8085	-----	----9205 TD	....	-----	-----	-----
Cayuga Field:											
Roeser & Pendleton, Inc.'s V. W. Bowyer 3	317	4749	5928-....	6166-7110	7110	----7482	7482-7682 TD	....	-----	-----	-----
Tide Water-Seaboard's J. N. Edens 15	313	4627	5792-6030	6030-6974	6974	----7365	7365-7570 TD	....	-----	-----	-----
Tide Water-Seaboard's Mrs. N. N. Wills 21-A	308	4524	5662-5890	5890-6827	6827	----7203	7203-7991	....	7991-9085 TD	-----	-----
Long Lake Field:											
Tide Water-Seaboard's Monnig Bros. 7	233	5904	7010-7205	7205-8343	8343	8643-8748	8748-9590	9590	9930-9971 TD	-----	-----
Jarvis:											
Humble O. & R. Co.'s Southern Pine 1-C	339	5040	6080-6300	6300-7400	7400	7615-7828	7828-....	....	8895-9155 TD	-----	-----
Camp Hill:											
Gulf's M. J. Ross 1	487	5452	-----	----7941	7941	-----	----8383 TD	....	-----	-----	-----
BOWIE COUNTY—											
S. O. Thompson-H. H. Jaffe's R. Rosemond 1	285	3530	4000-....	----5278	5278	5460-5698	5698-6016 TD	....	-----	-----	-----
FRANKLIN COUNTY—											
Talco Field:											
Ajo Oil Corp. et al's T. J. Sanders 1	371	4012	-----	4803-5143	5143	5248-5386	5386-....	....	5810-5904 TD	-----	-----
GREGG COUNTY—											
Humble & Gulf's E. D. Robertson 1	272	3341	4541-4876	4876-5617	5617	6214-6532	6532-....	....	7325-9160 Drl.	-----	-----
HENDERSON COUNTY—											
Flag Lake:											
S. Hunt, DeArman & McMillan's A. R. Dillard 1	361	3720	4689-4829	4829-5579	5579	5729-5899	5899-....	....	6429-6518 TD	-----	-----
La Rue Dome:											
American Liberty Oil Co. et al's E. B. LaRue-Johnson 1	464	5520	-----	----7525 TD	....	-----	-----	....	-----	-----	-----
Opelika:											
Tide Water-Seaboard-Humble's McElreath-Suggett 1	392	4951	6006-6270	6270-6930	6930	(Stray pay 7185-95 TD)		....	-----	-----	-----
Tide Water-Seaboard-Humble's McElreath-Suggett 2-C	452	5070	6087-6282	6282-6991	6991	7510-7712	7712-8510	8510	9073-9320 TD	-----	-----
HILL COUNTY—											
Humble O. & R. Co.'s M. Holderman 1	659	1370	-----	1885-....	....	-----	-----	....	2668-3398 TD	-----	-----
HOPKINS COUNTY—											
Sulphur Bluff:											
W. L. Goldston-Normandie Oil Corp.'s H. J. Smith 10	439	....	4499-5210	5210-5510	5510	5605-5707	5707-6600 TD	....	-----	-----	-----
HUNT COUNTY—											
Penn Oil Corp.-Wood Bros.' R. B. Parrish 1	597	4369	5015-....	----5930	5930	6215-6319	6319-6502 TD	....	-----	-----	-----
Superior Oil Co.'s (Cal.) P. D. Paul 1	489	3596	4237-....	----5190	5190	5339-5450	5450-6501 TD	....	-----	-----	-----
Stanolind O. & G. Co.'s J. P. Hawks 1	566	3730	4388-4819	4819-5335	5335	5460-5560	5560-....	....	5965-6570 TD Jkd.	-----	-----
KAUFMAN COUNTY—											
E. G. Colton, Lester & Duffield's Barrow Bros. 1	528	4194	4773-5165	-----	....	5820-5968 TD	Jkd.	....	-----	-----	-----

The Paluxy, or top section of the Trinity series, made its first entry as a source of crude production in March, 1936, at Talco, Titus County. Production prevails immediately south of the fault plane, which is a northeast extension of the Mexia-Corsicana-Powell series. Second Paluxy zone area was uncovered the following July at Sulphur Bluff, Hopkins County, also situated on the fault. Both of these areas were rated as excellent deep production prospects. Walter Goldston and Normandie Oil Corporation's Smith 10, only lower Trinity test at Sulphur Bluff, was abandoned in water after coring lower Glen Rose at 5707-6600 feet. Talco's two deep projects showed free oil in lower Glen Rose, but neither offered encouragement for commercial production.

Most important deep project in the Woodbine basin is the Gregg County test of Humble Oil & Refining Company and Gulf Oil Corporation on the E. D. Robertson 11.4-acre tract, Marshall Mann Survey, about 4 miles east of the East Texas field. This wildcat was drilling near base of Travis Peak at 9160 feet, according to late reports, and will likely explore the lower Marine and Reynolds lime. Gas showings recorded by a series of drill stem tests in the lower Glen Rose and upper Travis Peak are considered adequate to make commercial gas production if the hole is plugged back and tested through casing. Completion of high pressure gas production would eventually prove extremely profitable to the owners in connection with the operation of Woodbine producing leases in the East Texas field after the latter settle to the pumping stage. Repressuring of large leases would also be economical and practical in later years.

Until the past year deep tests in the Woodbine basin have been comparatively few. Preparation of geological maps contoured on the lower Glen Rose and Travis Peak, both excellent markers, are now possible to a limited extent. In the Woodbine belt proper, a total of 21 tests, scattered among 12 counties, have been carried to the Travis Peak. The accompanying tabulation of deep tests, listing the markers below the Georgetown lime, is the most complete record, and the first prepared for publication. Missing markers are due to the complete absence of specific formations, and in other instances definite calls were never made. Geologists were not familiar with the Trinity section and could not make positive calls on some of the earlier tests.

The accompanying tabulation reveals the thinning and thickening of the beds below the Georgetown. The Blackfoot prospect, Anderson County, affords an unusual contrast. It is about 9 miles southeast of the Cayuga field, and is lower structurally, with greater thickness noted in each zone below the Georgetown. Unusual variations prevail in general vicinity of the East Texas field, as will be noted by a comparison of formation thickness of tests in Rusk, Gregg and Upshur counties. First information on the deep zones on the west side of the giant field will be furnished by H. L. Hunt et al's Bradley 1, Chapel Hill area, Smith County, now drilling above the Georgetown lime. It is slated to drill through the Trinity series.

Condensed Log of Important Lower Trinity Tests Drilled in the East Texas Woodbine Basin

	Survey Elev.	Top Georgetown Lime	Paluxy Series	Upper Glen Rose	Top First Anhydrite	Massive Anhydrite	Lower Glen Rose	Top Pettit	Travis Peak Series	Lower Marine Series	Reynolds Lime
LAMAR COUNTY—											
Jas. A. Forrester et al's J. F. Woodward 1	402	2256	3060-....	....-....	....	3735-4105	4105-5203 TD	....	....-....	....-....	....-....
LIMESTONE COUNTY—											
Mexia Field:											
C. F. Lytle et al's J. L. Thompson 4	539	4075	....-....	4400-....	....	....-....	....-5735	....	5628-6061 TD	....-....	....-....
J. L. Thompson 1-T	549	....	....-....	....-....	....-....	....-....	....-....	....	....-6059 TD	....-....	....-....
Peyton Bros. et al's J. Steubenrauch 1	541	3914	....-....	4580-5080	5080	....-5100	5100-5706	....	5706-6116 TD	....-....	....-....
Pure Oil Co.'s W. B. Kendrick 16-T	520	3365	....-....	5270-5000	5000	....-5132	5132-....	....	5656-7676	7676-8763	8763-8847 TD Jkd.
E. L. Smith Oil Co. et al's J. Steubenrauch 1	529	3472	....-....	4143-5054	5054	....-....	....-....	....	....-5732 TD Jkd.	....-....	....-....
Thornton:											
Stanolind-Ramsey Pet. Corp.'s T. Norris 1	528	3255	3955-4060	4060-4886	4886	....-4894	4894-5375	5375	5528-7595	7595-8525	8525-8995
(Salt beds 8995-9785; anhydrite 9785-9845; conglomerate 9845-9951½ TD)											
NAVARRO COUNTY—											
P. S. Groginski et al's S. P. Love 1	422	2270	3150-3165	3165-3870	3870	....-3937	3937-4225 TD	....	....-....	....-....	....-....
Richland:											
Sun Oil Co.'s H. A. Swink 1-C	422	3550	4080-....	....-....	....	....-....	....-5415 Jkd.	....	....-....	....-....	....-....
Corsicana-Powell:											
R. L. Wheelock, Collins et al's I. N. Cerf 1	435	4307	....-....	4730-....	5108	....-5325	5325-....	....	5790-6506 TD	....-....	....-....
PANOLA COUNTY—											
Magnolia Pet. Co.'s E. A. Hull 2	222	2420	2870-3975	3975-4010	4010	4655-4875	4875-....	....	6024-8075	8075-8718 TD	Jkd. and pb
RAINS COUNTY—											
Emory:											
Humble O. & R. Co.'s O. L. J. Easter 1	438	5003	6079-6347	6347-6985	6985	....-7585	7585-....	....	7665-8482 TD	....-....	....-....
RUSK COUNTY—											
General Crude Oil Co. et al's Bivens Bros. 1	259	2960	3664-3925	3925-5350	5350	5598-5876	5876-6096 TD	....	....-....	....-....	....-....
Henderson:											
Nivia Oil Corp.'s Citizens Nat'l Bank 1	471	3340	....-4360	4360-5515	5515	6155-6395	6395-6802 TD	....	....-....	....-....	....-....
Mt. Enterprise:											
Barnett Pet. Corp. et al's S. C. Sanford 1	361	3275	....-....	....-5167	5167	5871-6079	6079-6511 TD	....	....-....	....-....	....-....
Pure Oil Co.'s W. H. Faulkner 1	563	3446	....-....	....-5310	5310	5945-6167	6167-....	....	7323-7799 TD	....-....	....-....
TITUS COUNTY—											
J. P. Flanagan-Sinclair Prarie's J. McGill 1	376	3935	4818-....	....-5630	5630	....-6270	6270-7193 TD	....	....-....	....-....	....-....
J. Z. Werby-Stroube et al's Sam Williams 1	341	3485	4275-....	....-5434	5434	....-5676	5676-6219 TD	....	....-....	....-....	....-....
Talco:											
Magnolia Pet. Co.'s J. A. Chapman 2	329	3416	4220-5028	5028-5335	5335	....-5584	5584-....	....	5651-5661 TD	....-....	....-....
UPSHUR COUNTY—											
Kelsey Dome—											
Amerada Pet. Corp.'s C. K. Wade 1	404	3882	....-....	....-6153 TD	....	....-....	....-....	....	....-....	....-....	....-....
Tom Hunter-American Liberty Oil Co.'s Chas. Carter 1	428	3943	4995-5338	5338-5978	5978	6283-6826	6826-....	7405	7525-7933 Drl.	....-....	....-....
VAN ZANDT COUNTY—											
J. Alvin Gardner-R. C. Ling's J. Leonard 1	508	4950	6057-6358	6358-6402 TD	....	....-....	....-....	....	....-....	....-....	....-....
Van Dome:											
Humble O. & R. Co.'s L. K. Riggs 1-a	463	3675	4645-(fault)	....-4860	4860	5100-....	....-....	....	6167-6325 TD	....-....	....-....
Pure Oil Co.'s V. T. Davis 1-T	488	3753	4729-4945	4945-5461	5461	....-5825	5825-....	....	6490-7501 TD	....-....	....-....

East Texas

Performance Record

By H. H. KING, Staff Writer

WOODBINE sand series in the East Texas basin area have produced more than one-third of the cumulative crude output of the state of Texas. Prior to November, 1920, when the Mexia field was opened, this outstanding high gravity oil source was classed as a water strata, and within 18 years has become the most productive geological horizon in the state. It is likewise to prove prolific in the future, for it holds more discovered unproduced crude reserves than any other formation in the state also. The majority of its reserves lie in a single field, East Texas, which is expected to yield another 2,000,000,000 barrels.

Performance history of the Woodbine explains its popularity with all classes of operators. Except for the south basin sector, it is found at comparatively shallow depths. Drilling conditions are most favorable, while the average cost per completed well is comparatively small. Flowing wells are currently being completed in the East Texas field at an average depth of 3650 feet within an elapsed period of from 7 to 15 days, with total cost varying from $8500 to $10,000.

Statistics on the East Texas field are of such magnitude that comparison with other fields only adds to its impressiveness. Operations as a whole are on the profitable side of the ledger, with an estimated yield of 8711 barrels per acre and 47,330 barrels average for each producer, according to year-end figures. Total of 199 completed oil wells had been depleted and plugged, else junked and abandoned due to mechanical trouble

Texas Woodbine Sand Fields

FIELD	Cumulative Production, Jan. 1, 1938	Estimated Crude Reserves	Estimated Ultimate Recovery
Mexia-Corsicana Fault Line Group:			
Corsicana-Powell	125,323,400	10,000,000	135,323,400
Mexia	95,312,900	12,000,000	107,312,900
Wortham	22,415,000	50,000	22,465,000
Richland	6,727,200	10,000	6,737,200
Currie	4,524,700	75,000	4,599,700
Nigger Creek	2,986,303	.....	2,986,303
Cedar Creek	297,945	.....	297,945
Total	257,587,448	22,135,000	279,722,448
Miscellaneous Woodbine Group:			
East Texas field	1,158,500,000	2,091,500,000	3,250,000,000
Van	111,050,000	213,950,000	325,000,000
Cayuga	7,253,600	52,746,400	60,000,000
Long Lake	914,200	5,085,800	6,000,000
Boggy Creek	4,644,000	356,000	5,000,000
Miscellaneous	262,693	1,099,400	1,362,093
Total	1,282,624,493	2,364,737,600	3,647,362,093
Woodbine total	1,540,211,941	2,386,872,600	3,927,084,541
Paluxy Group:			
Talco	11,241,900	63,758,100	75,000,000
Sulphur Bluff	1,605,107	13,394,893	15,000,000
Paluxy total	12,847,007	77,152,993	90,000,000

up to January 1. Actual cumulative production will never be determined, as scores of leases have produced in excess of 1,000,000 barrels of hot oil each. Operators responsible for this illicit production purposely avoided maintaining records, and accepted payments in lump cash sums.

Careful analysis of the cumulative production of the field through 1937, as prepared by recognized compilation bodies, accounts for a total of 1,158,500,000 barrels. This figure includes in excess of 110,000,000 barrels of partially and fully accounted for illicit production. Allowable production of the field from May 16, 1931 to January 1, 1938, according to Railroad Commission's records, is 1,011,570,000 barrels.

Corsicana-Powell field ranks second in production, with a cumulative yield of 125,323,400 barrels for an average output of 47,292 barrels per acre and 167,098 barrels per well. Minor portion of the oil has been derived through plugging back depleted Woodbine wells to shallow sands, and produced into same tank batteries with Woodbine wells. Van field has surpassed the Mexia area for third position, with a total recovery of 111,050,000 barrels, exclusive of shallow production, for an average yield of 196,549 barrels per well and 24,247 barrels per acre. The original Woodbine strike, which is also sparsely drilled, has amassed a total of 95,312,900 barrels, averaging 155,740 barrels per well and 25,622 barrels per acre.

Depletion stage is approaching for the Currie, Richland and Wortham fields, although the few remaining pumpers in each have sustained little decline the past year. Cedar Creek and Nigger Creek were the first to deplete, and the Camp Hill pool was eliminated the past year.

The East Texas Woodbine sand belt embraces the greatest known crude reserves from a single geological formation. This comparatively young high-gravity oil source has adversely affected the petroleum industry of the nation on more than one occasion through the spectacular performance of its prolific fields. Currently it holds the balance of power over the pe-

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troleum markets of the world, but is subjected to greater production restraint than any other major oil producing center.

Greatest single contribution of crude reserves arose from the discovery and development of the East Texas field, which yielded its first commercial production October 3, 1930. Routine development expanded its producing area to 133,000 acres, involving a crude reserve conservatively estimated at 3,250,000,000 barrels. This giant field is credited with having produced 1,158,500,000 barrels through 1937, and about two thirds of the estimated recoverable oil remains.

Cumulative production of oil from all Woodbine fields amounts to 1,540,211,941 barrels, since the completion of the first commercial well at Mexia in November, 1920, to the close of 1937.

Known Woodbine areas have not reached the half-way mark on depletion. Recoverable oil is estimated at 2,386,872,600 barrels, and the ultimate yield is calculated at 3,927,084,541 barrels.

Van field, situated near the geographical center of the East Texas basin, is securely entrenched as the second most productive Woodbine discovery. Unusual sand thickness is present in this dome-type structure. It has produced 111,050,000 barrels to establish a Woodbine record for oil yield per well, and has an estimated recovery of 325,000,000 barrels of oil.

The original group of Woodbine discoveries along the Mexia fault plane are currently at the stripper-well stage. Two areas have been depleted, and three more are nearly drained of commercial production from the Woodbine. The Corsicana-Powell field has produced 125,323,400 barrels, while the Mexia area, which was not densely drilled, has a slightly greater crude reserve.

Cayuga is classed as the most important of the several oil discoveries registered in the south portion of the basin, having a cumulative output of 7,253,600 barrels. Ultimate recovery is estimated at 60,000,000 barrels.

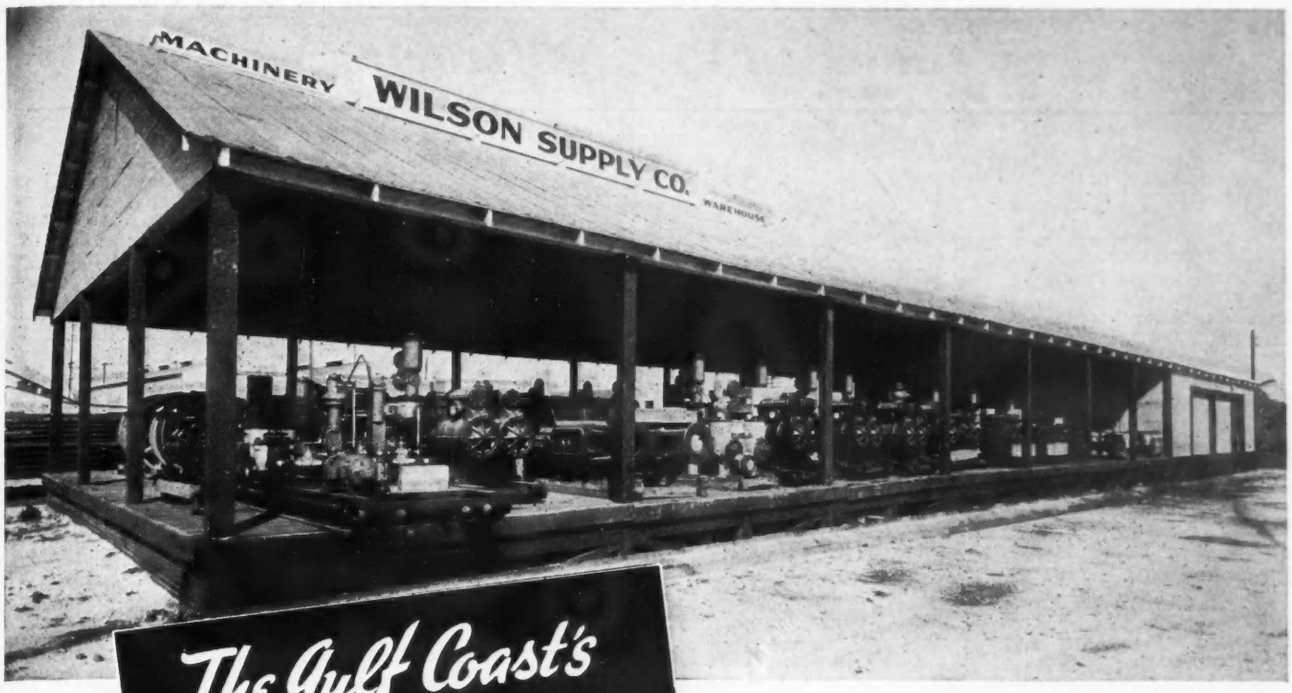
The Paluxy sandy-lime member of the upper Trinity geological section made its entry at Talco as a crude source in March, 1936. Four months later the same horizon was found productive at Sulphur Bluff. These areas have an ultimate crude yield of 75,000,000 barrels and 15,000,000 barrels, respectively. They have produced 12,847,000 barrels under rigid proration.

High-gravity distillate produced by natural gas wells in the Long Lake, Cayuga and other deep Woodbine fields in the south portion of the basin is of sufficient volume to warrant consideration in calculating the petroleum reserves of the district. This is also true of gas-distillate wells completed in the lower Trinity at Cayuga and Opelika. Enlargement of the market for the gas production will automatically boost the distillate yield, and no proration applies to the latter.

East Texas Fields Have High Performance Record

FIELD	Date Discovered	Total Producing Acres	Total Wells Drilled	Average No. Acres per Well	Wells Producing Jan. 1, 1938	Gross Production to Jan. 1, 1938	Average Crude Yield per Acre	Average Crude Yield per Well
MEXIA-CORSICANA FAULT LINE WOODBINE GROUP								
Corsicana-Powell	1- 7-23	2,650	750	3.53	168	125,323,400	47,292	167,098
Mexia	11-19-20	3,720	612	6.08	264	95,312,900	25,622	155,740
Wortham	11-22-24	715	324	2.21	7	22,415,000	31,350	69,182
Currie	10-..-21	600	83	7.23	13	4,524,700	7,541	54,514
Richland	12-..-23	240	103	2.33	2	6,727,200	28,030	65,313
Nigger Creek	7- 8-26	170	79	2.15	[A]	2,986,303	17,566	37,801
Cedar Creek	8-24-27	25	14	1.79	[B]	297,945	11,918	21,282
Total	.....	8,120	1,965	4.13	454	257,587,448	31,723	131,088
MISCELLANEOUS WOODBINE GROUP								
East Texas	10- 3-30	133,000	24,477	5.44	24,278	1,158,500,000	8,711	47,330
Van	10-14-29	4,580	565	8.11	557	111,050,000	24,247	196,549
Cayuga	3- 1-34	4,500	245	18.37	245	7,253,600	1,612	29,607
Boggy Creek	3-21-27	1,000	52	19.23	21	4,644,000	4,644	89,308
Long Lake	10-14-33	1,200	49	24.49	49	914,200	762	18,657
Camp Hill	6-15-35	30	3	10.00	.....	(See Sub-Clarksville)		
Rusk	6- 3-34	40	4	10.00	3	247,000	6,175	61,750
Percilla	5-10-37	10	1	10.00	1	11,662	1,166	11,662
Flag Lake	11-16-37	10	1	10.00	1	3,600	360	3,600
Grapeland	10- 4-37	10	1	10.00	1	431	43	431
Total	.....	144,380	25,398	5.68	25,136	1,282,624,493	8,815	50,505
SUB-CLARKSVILLE SAND								
Camp Hill	1-31-35	200	10	20.00	[C]	285,149	1,426	28,515
WOODBINE GAS-DISTILLATE GROUP								
Buffalo	12-22-33	20[D]	2	10.00	2	.....	.....	.....
Buffalo, North	5-18-34	10[D]	1	10.00	1	.....	.....	.....
Cayuga (Gas)	3- 1-34	12,500[E]	32	390.62	32	.....	.....	.....
Elkhart	1-16-38	10[D]	1	10.00	1	.....	.....	.....
Grapeland	7-14-36	30[D]	3	10.00	3	.....	.....	.....
Groesbeck-Bains	1924	60	5	12.00	.....	.....	.....	.....
Long Lake (Gas)	10-14-33	15,000[E]	31	483.87	31	.....	.....	.....
Red Lake	5-18-34	30[D]	3	10.00	3	.....	.....	.....
Total	.....	27,660	78	354.61	73	.....	.....	.....
NACATOCH SAND								
Van (Shallow)	3- 7-33	200[F]	36	.....	30	201,372	100	5,694
NONCLASSIFIED								
Kosse	8-18-22	10	1	10.00	.....	27,000	2,700	27,000
PALUXY SANDY-LIME								
Sulphur Bluff	7-11-36	600	73	8.22	73	1,605,107	2,675	21,988
Talco	3-16-36	5,000	630	7.94	597	11,241,900	2,248	17,844
Total	.....	5,600	703	8.08	670	12,847,007	2,461	19,916
LOWER TRINITY								
Cayuga (Gas-Dist.)	11- 6-35	20	2	10.00	2	.....	.....	.....
Mexia (Gas)	5-28-35	10	1	10.00	.....	.....	.....	.....
Opelika (Oil)	5- 7-37	10	1	10.00	1	3,250	325	3,250
Opelika (Gas-Dist.)	11-30-37	10	1	10.00	1	.....	.....	.....
Total	.....	50	5	10.00	4	3,250	325	3,250

[A] Field depleted July, 1931.
[B] Field depleted June, 1931.
[C] Three wells produced from Woodbine. All depleted and plugged October, 1937.
[D] Insufficient development to indicate productive acreage.
[E] Proved gas acreage in upper Woodbine also overlaps the oil producing area.
[F] Estimated due to isolated wells from main pool.



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Index to Field Histories

ARKANSAS

Bradley 153
Bragg (Camden) 153
Buckner 153
Champagnolle 154
Columbia County **153**
Garland City (Miller County) 153
El Dorado 154
Irma 153
Lafayette County **153**
Lisbon 155
Miller County **153**
Mount Holly 154
Nevada County **153**
Ouachita County **153**
Rodessa 153
Schuler 155
Smackover 154
Snow Hill 154
Stephens 153
Troy 153
Union County **154**
Urbana 155

NORTH LOUISIANA

Bienville Parish **155**
Bear Creek 155
Bisteneau 155
Driscoll 155
Bossier Parish **155**
Bellevue 155
Carterville (Sarepta) 155
Elm Grove 155
Sligo 155
Caddo Parish **156**
Blanchard (Longwood) 156
Caddo (District) 156
Cedar Grove 156
Dixie 156
Rodessa 156
Claiborne Parish **158**
Haynesville 158
Homer 158
Lisbon 158
Sugar Creek 158
De Soto Parish **160**
Benson 160
De Soto 160
Grogan (Ramsey) 160
Holly 160
Red River 160
East Carroll Parish **160**
Epps (Floyd) 160
La Salle Parish **160**
Urania (Tullos) 160
White Sulphur Springs 162
Lincoln Parish **162**
Montcalm (Simsboro) 162
Ruston 162
Morehouse Parish **162**
Ouachita Parish **162**
Red River Parish **162**
Bull Bayou 162
Crichton 162
Red River (Bull Bayou-Crichton) 162
Richland Parish **162**
Richland 162
Sabine Parish **164**
Blue Lake (West Zwolle) 164
Converse 164
Pleasant Hill 164
Spring Ridge 164
Zwolle 164
Union Parish **164**
Monroe 164
Oakland 164
Webster Parish **164**
Cotton Valley 164
Shongaloo 165
Dubberly 165
Sibley (Dubberly) 165

EAST TEXAS

Anderson County **165**
Bethany 171
Boggy Creek 165
Buffalo 169
Caddo 169
Camp Hill 165
Cass County **166**
Cayuga 165
Cedar Creek 168
Cherokee County **166**
Corsicana-Powell 170
Currie 170
East Carthage 171
East Texas 165
Elkhart 166
Flag Lake 167
Franklin County **171**
Freestone County **167**
Grapeland 168
Gregg County **165**
Harrison County **167**
Haslam 171
Henderson County **167**
Hopkins County **168**
Houston County **168**
Kosse 168
Leon County **169**
Limestone County **168**
Long Lake 166
Marion County **169**
Mexia 168
Navarro County **170**
Nigger Creek 169
Opelika 167
Panola County **171**
Pickering 171
Procella 168
Red Lake 167
Richland 170
Rodessa 166
Rusk 166
Rusk County **165**
Shelby County **171**
Shelbyville 171
Smith County **165**
Sulphur Bluff 168
Tacoma 171
Talco 171
Titus County **171**
Van 171
Van Zandt County **171**
Waskom 167
Wortham 169

ARK-LA-TEX OIL AND GAS FIELDS

Compiled by
H. H. KING and FRANK B. TAYLOR of THE OIL WEEKLY Staff

Acknowledgment is made of valuable assistance given by many operators, state department officials, National Oil Scouts Association, Bureau of Mines reports and independent authorities.

ARKANSAS

COLUMBIA COUNTY

BUCKNER

Section 8-16s-22w. **Discovery Well:** Standard Oil Co. of Louisiana's McKean 1, 8-16s-22w, Nov. 30, 1937, 350 bbls 32 gravity from Permian Lime 7258 ft. **Type Structure:** Anticline. **Discovery Means:** Geophysics. **Producing Area:** Discovery well. **Estimated Ultimate Recovery:** 10,000,000 bbls (based on productive characteristics of structure and productivity of single well). **Production to 1938:** 20,026 bbls. **Remaining Reserve:** 9,979,974 bbls. **Daily Production Feb. 1, 1938:** 150 bbls, 1 well. **Gravity:** 32 degrees. **Rigs Running Feb. 1, 1938:** 2. **Principal Leaseholders:** Standard Oil Co. of Louisiana. **Pipe Lines:** Truck. **Remarks:** Found 62 ft productive saturation in discovery well.

STEPHENS

Township 15s-19 and 20w, and extending into Ouachita County. **Discovery Well:** Hudes & Aarnes' Brown 1, 13-15s-20w, June 2, 1922. **Subsequent Discoveries:** Development proved two sands. In 1925, Buffalo Oil Company's Culp 1 found Nacatoch production at 1540 feet. **Productive Formations:** Nacatoch and Blossom horizons, 1500 to 2300 ft. **Type Structure:** Nosing Lens. **Discovery Means:** Surface geology. **Producing Area:** 2800 acres. **Extent Developed:** Productive area evidently defined. As producing strata generally show less than 10 ft saturation, the per-acre recovery is low. **Deepest Test:** Trinity was non-productive at 4500 ft. **Estimated Ultimate Recovery:** 8,180,000 bbls. **Production to 1938:** 5,951,874 bbls. **Remaining Reserve:** 2,228,126 bbls. **Daily Production Feb. 1, 1938:** 600 bbls, from 189 wells. **Gravity:** 30 degrees. **Principal Leaseholders:** Ohio Oil Company. **Pipe Lines:** Line to loading rack. **Remarks:** Nacatoch sand wells making considerable water. Local name of Stephens sand is often applied to deeper strata.

LAFAYETTE COUNTY

BRADLEY

Township 19s-24w. **Discovery Well:** Arkansas Fuel Oil Co.'s P. M. Allen 1, SEc SW 18-19s-24w, Dec. 1, 1925. **Producing Formation:** 2770 to 3088 ft. **Type Structure:** Low-lying dome. **Discovery Means:** Surface geology. **Producing Area:** 300 acres. **Extent Developed:** Considered at economic limit of development, due to wells being generally less than 80 barrels initial. Practically depleted. **Estimated Ultimate Recovery:** 84,200 bbls. **Production to 1938:** 84,200 bbls. **Gravity:** 25.5 to 28 degrees. **Pipe Lines:** Arkansas Natural Gas Co., Arkansas Fuel Co.

MILLER COUNTY

GARLAND CITY (Miller County)

On lines of Townships 15 and 16, Range 26w. **Discovery Well:** C. V. Lenz's Johnson 1, NEc NW SW 24-15s-26w, July 4, 1930, red beds, 2800 to 3000 ft, 50 bbls 28 gravity. **Subsequent Discoveries:** C. V. Lenz's Dale 7, C E½ W½ 24-15-26, made 100 bbls 46 gravity from Glen Rose at 4215 ft in Dec., 1936. Offsets were dry. **Type Structure:** Dome, with production from lenticular sands. **Discovery Means:** Surface geology, with deep test based on correlation and geophysical work. **Producing Area:** 720 acres. **Extent Developed:** Considered defined, with some inside locations remaining to be drilled. Shallow production is scattered, and deep is to be developed. **Deepest Test:** E. H. Moore's Dale 1, 24-15s-26w, to 7310 ft in Permian lime topped 7278, elevation 250, abn. **Estimated Ultimate Recovery:** 2,180,000 bbls. **Production to 1938:** 1,606,015 bbls. **Remaining Reserve:** 573,985 bbls. **Daily Production Feb. 1, 1938:** 355 bbls, from 21 wells. **Gravity:** Shallow pay 28-30 degrees, deeper pay 45-47 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Magnolia Petroleum Co. **Pipe Lines:** Standard Oil Co. of Louisiana.

RODESSA (Capps)

See also Rodessa, Caddo Parish, Louisiana; and Cass and Marion Counties, Texas.

Township 19 and 20s-27 and 28w, extreme southwestern corner of State and with productive area extending unbroken into Louisiana and Texas. **Discovery Well:** W. L. McClanahan's Capps 1, 11-20-28, extended Rodessa production in Arkansas in 1937, when it made 500 bbls 38 gravity oil at 6115 ft in Glen Rose. **Producing Formations:** Gloyd and Mitchell sands and sandy lime sections, showing considerable variation in porosity and saturation. **Type Structure:** Trap flanking major fault. **Discovery Means:** Trend play. **Producing Area:** 1640 acres. **Extent Developed:** Although it is considered defined as to extent, the Arkansas side of Rodessa will have a number of inside locations drilled as a result of early wide spacing. **Deepest Test:** None of significance below controlling salt water table. **Estimated Ultimate Recovery:** (Miller County only) 27,600,000 bbls. **Production to 1938:** 1,300,000 bbls. **Remaining Reserve:** 26,300,000 bbls. **Daily Production Feb. 1, 1938:** 7614 bbls from 64 wells. **Gravity:** 36 degrees to distillate. **Rigs Running Feb. 1, 1938:** 11. **Principal Leaseholders:** F. W. Buford, W. C. Feazel, Grasty et al, Guaranty Oil Co., Auding & Byrd, Hunt Oil Co., Kroll & Travis, Lacy-Riley Drilling Co., Layton Oil Co., Chirneo Production Co., W. C. McClanahan, McMurray et al, R. W. Newell, J. R. Ostrom, Tom Potter, Roberts Brothers, Red Iron Drilling Co., Skelly Oil Co., Staniforth, Thompson & Jaffe, A. M. Sutton, Texas-Canadian Oil Corp. and S. O. Thompson. **Pipe Lines:** Arkansas Pipe Line Co., Caddo Pipe Line Corp., East Texas Gasoline Co., Gulf Refining Co., Magnolia Pipe Line Co., Standard Oil Co. of Louisiana, United Pipe Line Co., American Liberty Pipe Line Co.

NEVADA COUNTY

IRMA

Township 14s-21w. **Discovery Well:** Ames & Zengy's Waters 1, 11-14s-21w, Oct. 17, 1921. **Producing Formation:** Nacatoch, 1200 ft. **Type Structure:** Faulted anticline. **Discovery Means:** Surface geology. **Producing Area:** 940 acres. **Extent Developed:** Field is considered very nearly at maximum stage of development unless deeper strata is found productive. **Deepest Test:** Found Trinity non-productive at 3735 ft. **Estimated Ultimate Recovery:** 8,060,000 bbls. **Production to 1938:** 6,197,106 bbls. **Remaining Reserve:** 1,862,894 bbls. **Daily Production Feb. 1, 1938:** 255 bbls from 67 wells. **Gravity:** 14-15 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** L. M. Glasco, O. F. Whitaker. **Pipe Lines:** Loading rack for shipment, chiefly to local plant.

TROY

Township 14s-20w. **Discovery Well:** Benedum & Trees Oil Co.'s Groves 1, 10-14s-20w, Dec. 5, 1936, 19 bbls 20 gravity. **Subsequent Discoveries:** Tokio production was proven in discovery well; the more shallow and less important production being a secondary discovery. **Producing Formations:** Nacatoch, chiefly gas, 1200 ft; Tokio 2200 ft. **Type Structure:** Steeply folded anticline, probably faulted. **Discovery Means:** Surface geology. **Producing Area:** 320 acres. **Extent Developed:** This field appears to be drilled to economic density. **Estimated Ultimate Recovery:** 2,850,000 bbls. **Production to 1938:** 334,261 bbls. **Remaining Reserve:** 2,515,739 bbls. **Daily Production Feb. 1, 1938:** 1190 bbls from 11 wells. **Gravity:** Nacatoch 14 degrees; Tokio 19 to 21 degrees. **Rigs Running Feb. 1, 1938:** 2. **Principal Leaseholders:** Benedum & Trees Oil Co. **Pipe Lines:** Arkansas Pipe Line Corp.

OUACHITA COUNTY

GRAGG (Camden)

Sections 24 and 25-13s-18w. **Discovery Well:** T. J. Gaughan's M. Bragg 1, SEc NE SE 25-13-18s, Dec. 9, 1934. **Producing Formation:** Nacatoch sand 1369 ft. **Type Structure:** Minor high on trend. **Discovery Means:** Surface geology. **Producing Area:** 80 acres. **Extent Developed:** Completely delimited by dry holes. **Deepest Test:** Berry et al's Adams 1, NWc NE 30-13s-18w, abd 2300 ft. **Daily Production Feb. 1, 1938:** 7 bbls, 1 well. **Gravity:**

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26 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** T. J. Gaughan. **Pipe Lines:** By truck.

MOUNT HOLLY

Township 15s-18w. **Discovery Well:** McDonald Oil Corp.'s Wilson 1-A, NEc NE SW 25-15s-18w, April 13, 1929. **Producing Formation:** Mount Holly sand (Glenrose), average 2800 ft. **Type Structure:** Dome. **Discovery Means:** Surface geology, with subsurface control. **Producing Area:** 120 acres. **Extent Developed:** Completely developed in the shallow sand. Deeper exploration is expected to be carried out as a result of recent geophysical activity in region. **Estimated Ultimate Recovery:** 38,000 bbls. **Production to 1938:** 38,000 bbls. **Daily Production Feb. 1, 1938:** Field was abandoned in 1931. More recently, some of the wells were placed back on production with a reported 65 bbls having been obtained over a 30-day period. **Gravity:** 31 degrees. **Rigs Running Feb. 1, 1938:** None. **Remarks:** Area is being released.

SMACKOVER

Townships 15 and 16s-15, 16 and 17w, and extending unbroken into Union County. **Discovery Well:** V. K. F. Drilling Co.'s Richardson 1, SE NE 29-15s-15w, July 23, 1922. **Subsequent Discoveries:** Snow Hill was dependent upon Smackover. Union County incorporated a major portion of the field, later development proving the two areas to be one. Lion Oil Refining Co.'s Graves 6, 3-16s-15w, completed Jan. 28, 1925, in Graves (Blossom) sand at 2501 ft. This well, and the previous test to the Nacatoch sands, proved the importance of the pool. Deeper strata were later proven. **Type Structure:** Normal Anticline. **Discovery Means:** Trend and surface geology. **Producing Area:** 26,300 acres. **Extent Developed:** 98 percent developed. Although there are still a few inside locations vacant, with the present depletion trend of the field it would be uneconomic to drill. **Deepest Test:** Two deep tests were drilled, one in 5-16-16, near the center of the western globe of the field, to 7973 ft, the deepest test to date in Arkansas. The second test in the east side of production went to Permian salt at 7225 ft. Both abd. **Estimated Ultimate Recovery:** 432,000,000 bbls. **Production to 1938:** 349,965,250 bbls. **Remaining Reserve:** 82,034,750 bbls. **Daily Production Feb. 1, 1938:** 17,700 bbls from 1740 wells. **Gravity:** North portion 19-24 degrees; south portion 28-30 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Lion Oil Refining Co., Skelly Oil Co., Magnolia Petroleum Co., The Texas Co., Gilliand Co., Stout Lumber Co., L. Werner Co., Sun Oil Co., Ohio Oil Co., Gulf Oil Corp., Atlantic Oil Producing Co., Standard Oil Co. of Louisiana, Humble Oil & Refining Co., Pan American Oil Co., Amerada Petroleum Corp., Federal Petroleum Co., Danciger Oil & Refineries, Inc., Phillips Petroleum Co., J. E. Crosbie, Pure Oil Co., Marine Oil Co., Root Refining Co., Harry H. Cross. **Pipe Lines:** Standard Oil Company of Louisiana, Magnolia Pipe Line Co., Lion Oil Refining Co., Arkansas Pipe Line Co. **Remarks:** Prior to successfully completing the credited discovery, Oil Operators Trust's Murphy 1, 8-16s-15w, April 14, 1922, cratered from 2024 making oil and gas, and was lost. When at stage of maximum development, field ranked first in United States.

SNOW HILL

Section 27-15s-15w, northeast of the flank of Smackover field. **Discovery Well:** Phillips Petroleum Co.'s Reynolds B-1, SE SE NW 27-15s-15w, April 28, 1936, Permian lime (Reynolds) 4926 ft, 300 bbls 43 gravity. **Type Structure:** Anticline. **Discovery Means:** Geophysics. **Producing Area:** 140 acres. **Extent Developed:** Apparently has received maximum development in keeping with economic production, as pressures dropped rapidly and wells quickly developed salt water. **Deepest Test:** None below Permian, although a deeper test is contemplated. To date the deepest test went to 5717 ft, and pb to lime pay. **Estimated Ultimate Recovery:** 200,000 bbls. **Production to 1938:** 79,034 bbls. **Remaining Reserve:** 120,966 bbls. **Daily Production Feb. 1, 1938:** 200 bbls from 6 wells. **Gravity:** 43 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Phillips Petroleum Co., Lion Oil Refining Co., Standard Oil Co. of Louisiana. **Pipe Lines:** Truck by Lion Oil Refining Co. **Remarks:** This deep Permian lime discovery, proving first production from the horizon in North Louisiana and Arkansas, was the impetus which fostered tests to the same strata in Schuler and Bucker, each being productive. It is evident that the discovery opens a new, major pay to exploration in both older areas, and in wildcat territory.

UNION COUNTY

CHAMPAGNOLLE (Rainbow)

Centering in Township 17s-14w. **Discovery Well:** Ohio Oil Co.'s Crain 1, 1-17s-14w, June 22, 1927, 50 bbls 34 gravity. **Subsequent Discoveries:** Normal extensions. Pure Oil Co.'s Gregory 1, 10-17s-14w, April 4, 1928, was important in proving the prolific production when it made initial of 2000 bbls from 3141 to 3153 ft in Woodbine. **Type Structure:** Lensing nose. **Producing Formations:** Tokio and Woodbine and Crain sands, 2800 to 3350 ft. **Discovery Means:** Surface geology and trend from Smackover southeast. **Producing Area:** 2200 acres. **Extent Developed:** Defined except for possible minor fingerings. **Deepest Test:** Permian salt was reached in a test to 6911 ft. **Estimated Ultimate Recovery:** 27,500,000 bbls. **Production to 1938:** 12,416,600 bbls. **Remaining Reserve:** 15,083,400 bbls. **Daily Production Feb. 1, 1938:** 1200 bbls from 79 wells. **Gravity:** 33 to 34 degrees. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Marine Oil Co. **Pipe Lines:** Standard Oil Co. of Louisiana, Lion Oil Refining Co., Root Refining Co. **Remarks:** Although large percentage of daily production is water, net crude figure is holding up well.

EL DORADO

Chiefly in Township 18s-15w. **Discovery Well:** Mitchell & Busey's Armstrong 1, 31-17s-15w, Jan. 10, 1921, 20,000,000 cu ft gas and 3000 bbls oil. This well marked the opening of concerted explora-

tion in Arkansas, as well as the El Dorado boom. After producing unrestricted, the well killed itself and was abandoned in April, 1921. **Subsequent Discoveries:** East El Dorado was opened by Terry Summerfield Oil Co.'s Smith 1, 30-17s-14w, Jan. 10, 1922. Natural Gas & Petroleum Co., El Dorado Natural Gas Co. and Gulf Refining Co. opened new and important strata following initial discovery of the pool. **Type Structure:** Anticline. **Producing Formation:** Nacatoch at average of 2180 ft. Tokio-Woodbine 2900 to 3000 ft; Meakin sand 2500 ft. **Discovery Means:** Surface geology worked on regional high. **Producing Area:** 10,000 acres. **Extent Developed:** Field defined, with few locations undrilled. **Deepest Test:** Structure has been tested to Trinity at 3400 ft. With increased interest in deeper production in the general area, other deep exploration seems certain. **Estimated Ultimate Recovery:** 97,850,000 bbls. **Production to 1938:** 58,825,550 bbls. **Remaining Reserve:** 39,024,450 bbls. **Daily Production Feb. 1, 1938:** 1865 bbls from 283 wells. **Gravity:** 29-32 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Arkansas Natural Gas Co., Humble Oil & Refining Co., Standard Oil Co. of Louisiana, Phillips Petroleum Co., Harris Drilling Co., Amerada Petroleum Corp., Houston Oil Co., Woodley Petroleum Co., El Dorado Petroleum Co., Skelly Oil Co., Federal Petroleum Corp., Magnolia Petroleum Co., Atlantic Refining Co., Marine Oil Co., Rovenger Oil & Gas Co., Pure Oil Co., Sinclair Prairie Oil & Gas Co. **Pipe Lines:** Gulf Pipe Line Co., Standard Oil Co., Lion Oil Refining Co., Root Refining Co. **Remarks:** Approximately 75 percent of present production is water.

LISBON

Township 17s-16w. **Discovery Well:** Raines et al's Dumas 1, 9-17s-16w, Dec. 31, 1925, 35 bbls 35 gravity, Nacotoch sand 2070 ft. **Type Structure:** Monoclinic lense. **Discovery Means:** Surface geology. **Producing Area:** 2100 acres, being reduced through depletion. **Extent Developed:** Area has received normal maximum development in past producing horizons. **Deepest Test:** 3510 ft. **Estimated Ultimate Recovery:** 7,500,000 bbls. **Production to 1938:** 6,435,291 bbls. **Remaining Reserve:** 1,064,709 bbls. **Daily Production Feb. 1, 1938:** 255 bbls from 141 wells. **Gravity:** 34-35 degrees. **Rigs Running Feb. 1, 1938:** None. **Pipe Lines:** Magnolia Pipe Line Co., Lion Oil Refining Co.

SCHULER

Centering in Township 18s-17w. **Discovery Well:** Lion Oil Refining Co.'s Morgan 1, 18-18s-17w, April 6, 1937, 300 bbls 38 gravity, from Travis Peak at 5559 ft. **Subsequent Discoveries:** Edwin M. Jones Marine 1, nw sw se 17-18-17w, 2500 bbls 32 gravity Jones (Lower Marine) sand 7607-16 ft. Lion Oil Refining Co.'s Morgan A-1, 18-18-17w, 600 bbls distillate, Permian lime (Reynolds) 7579-7616 ft. **Type Structure:** Dome. **Discovery Means:** Geophysical. **Producing Area:** 700 acres, no limiting features so far observed. **Extent Developed:** Development only beginning. **Deepest Test:** Edwin M. Jones' Marine 2, sw nw se 17-18-17w, drilled to 7950 ft, dry, pb to Jones sand for producer. **Estimated Ultimate Recovery:** 200,000,000 bbls. **Production to 1938:** 1,470,000 bbls. **Remaining Reserve:** 198,530,000 bbls. **Daily Production Feb. 1, 1938:** 15,000 bbls from 28 wells. **Gravity:** Morgan, 41 degrees, Jones, 32 degrees, and distillate about 68 degrees. **Rigs Running Feb. 1, 1938:** 19. **Principal Leaseholders:** Lion Oil Co., Marine Oil Co., Phillips Petroleum Co., Alice-Sidney Oil Co., Edwin M. Jones. **Pipe Lines:** Lion Oil Refining Co., Root Refining Co. **Remarks:** The discovery well was started by Phillips Petroleum Co. and was drilled to 4270 ft; Lion Oil Refining Co. resumed and completed.

URBANA

Township 18s-13w. **Discovery Well:** Marine Oil Co.'s Thompson 3-A, 10-18s-13w, Jan., 1930. **Producing Formation:** Red Beds at 3550 ft. **Type Structure:** Anticline. **Discovery Means:** Trend geology from El Dorado play. **Producing Area:** 750 acres. **Extent Developed:** Field is developed to maximum at depth and is delimited by failures. Rapid depletion by reason of thin pay. **Deepest Test:** Trinity non-productive at 4501 ft. **Estimated Ultimate Recovery:** 7,575,000 bbls. **Production to 1938:** 4,066,551 bbls. **Remaining Reserve:** 3,508,449 bbls. **Daily Production Feb. 1, 1938:** 800 bbls from 32 wells. **Gravity:** 19 to 20 degrees. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Marine Oil Co., McCreslen Oil Co. **Pipe Lines:** To Lion Oil Refining Co. by tank car. **Remarks:** Gas production encountered here following exploration away from the El Dorado strike lead to the discovery of oil.

NORTH LOUISIANA

BIENVILLE PARISH

BEAR CREEK

Section 3-16n-6w. **Discovery Well:** Seaboard Oil Co.'s F. E. McGee 1, C SW NE 3-16n-6w, Mar. 14, 1937; distillate from Travis Peak 5880 ft. **Subsequent Discoveries:** Hunt and Seaboard Oil Co.'s Commercial Bank 1, C NE NW 3-16-6w, distillate at 6801 ft in Travis Peak. **Type Structure:** Dome. **Discovery Means:** Geophysical. **Producing Area:** Not defined, 600 acres, minimum. **Deepest Test:** Discovery went to 8016 ft, pb to 5880 ft for completion. **Daily Production Feb. 1, 1938:** None, wells shut in, no gas market. **Gravity:** Distillate. Chiefly natural gas. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Seaboard Oil Co., H. L. Hunt.

BISTENEAU

Township 16n-10w. **Discovery Well:** De Soto Oil & Gas Co.'s Ashley 1, C SW SE 15-16n-10w, Sept. 8, 1937, Glen Rose 5200 ft, 25M wet gas. **Type Structure:** Nosing anticline. **Discovery Means:** Discovered through prior gas wells drilled on the feature, which produced but were abandoned prior to Ashley completion. **Producing Area:** 200 acres minimum. **Extent Developed:** Pool is not developed, also recently obtained pipe line outlet is expected to spur drilling. Gas rights have been sold. **Deepest Test:** Discovery well was pb from 5650 ft. **Daily Production Feb. 1, 1938:** Shut in. **Gravity:** Distillate. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** De Soto Oil & Gas Co., Union Producing Co., R. O. Roy.

DRISCOLL

Township 12n-5w. **Discovery Well:** Lide & Greer et al's Davis Brothers Lumber Co. 1, 12-16n-5w, June, 1936, gas and distillate from Glen Rose 6141 ft. **Subsequent Discoveries:** Same operator's J. D. Smelley 1, 18-16-4w, opened sand production at 7180 ft, Travis Peak. Made distillate. **Type Structure:** Dome. **Discovery Means:** Geophysical based on surface indications. **Producing Area:** Three wells, undefined, not less than 800 acres. **Deepest Test:** Smelley 1, above. **Gravity:** Distillate. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Lide & Greer, Arkansas-Louisiana Gas Co. **Pipe Lines:** Gas outlet, Arkansas-Louisiana Gas Co.

BOSSIER PARISH

BELLEVUE

Township 19n-11w. **Discovery Well:** R. O. Roy & Co.'s Railroad Lands Co. 7, NW NE 15-19-11w, Nov. 13, 1921, 6000 bbls daily from 400 ft in Nacatoch. **Subsequent Discoveries:** A test to strata below the oil sand proved commercial gas in the Buckrange between 1000 and 1080 ft, and in lower Trinity about 1800 ft. **Producing Formation:** Nacatoch sand, 375 to 400 ft. **Type Structure:** Faulted dome. **Discovery Means:** Surface geology, with late geophysical work. Core drilling added to knowledge of subsurface. **Producing Area:** 850 acres. **Extent Developed:** Productive limits established through routine operations. As a result of normally small output per well, the field was not produced from 1932 to 1934. After the latter date, additional wells were drilled and old ones were placed on production. Field is being normally exhausted. **Deepest Test:** A deep test encountered Lower Trinity dry and was abandoned at 6137 feet; proved domal truncation. **Estimated Ultimate Recovery:** 9,720,000 bbls. **Production to 1938:** 9,501,130 bbls. **Remaining Reserve:** 218,870 bbls. **Daily Production Feb. 1, 1938:** 579 bbls from 110 wells. **Gravity:** 19 to 21 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Premier Investment Co. **Pipe Lines:** Tank car and truck.

CARTERVILLE (Sarepta)

Centering in Section 30-23n-11w. **Discovery Well:** Woodley & Collins' Robinson 1, 22-23-12w, Feb., 1927, 40,000,000 cu ft gas from 3050 ft. **Subsequent Discoveries:** Although some crude shows were obtained in the early gas producers, it was not until 1929 that commercial oil was found. Trend production was encountered. **Producing Formation:** Buckrange produces at near 2900 ft and Tokio at 3150 ft. **Type Structure:** Local high on trend. Anticline with insufficient closure to produce major accumulation. **Discovery Means:** Surface geology and subsurface correlation. **Producing Area:** 1500 acres. **Extent Developed:** Area apparently defined for shallow production. Commercial gas has been exhausted. **Estimated Ultimate Recovery:** 3,800,000 bbls. **Production to 1938:** 2,530,417 bbls. **Remaining Reserve:** 1,269,583 bbls. **Daily Production Feb. 1, 1938:** 280 bbls from 51 wells. **Gravity:** 44 degrees. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Magnolia Petroleum Co., Arkansas Fuel Oil Co., The Texas Co. **Pipe Lines:** Standard Oil Co. of Louisiana, Magnolia Pipe Line Co.

ELM GROVE

Section 16n-11 and 12w. **Discovery Well:** First recorded production from field was of gas in 1916. Oil found in 1922. **Subsequent Discoveries:** First production of gas was from 800 ft. In 1918 deeper production was proven, and in 1922, a portion of the area was proven for crude. **Producing Formations:** Nacatoch sand at 800 ft, Buckrange 1150 ft, Tokio 2400 to 2500 ft. **Type Structure:** Anticline with domal characteristics. **Discovery Means:** Geology. **Producing Area:** Gas area proven at 14,500 acres, oil area at about 1225 acres. **Extent Developed:** Defined and being depleted. **Estimated Ultimate Recovery:** 4,200,000 bbls. **Production to 1938:** 3,213,698 bbls. **Remaining Reserve:** 986,302 bbls. **Daily Production Feb. 1, 1938:** 315 bbls from 35 wells. **Gravity:** 28-32 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** C. B. Hodges, Gulf Refining Co., Union Producing Co., The Texas Co. **Pipe Lines:** Tank car. United Gas Co. **Remarks:** The area productive of oil in the Elm Grove field is small, and is confined to the center of the gas area.

SLIGO

Chiefly within Township 17n-12w. **Discovery Well:** Sligo Syndicate's McDade 1, gas in Nacatoch in 1922. **Subsequent Discoveries:** Field was gradually extended and deeper gas producing strata were drilled. Petitt sand of Basal Glen Rose furnishes oil production. **Producing Formations:** Nacatoch sand 850 ft, Buckrange 1700 ft, Tokio 2450 ft, sand 2780 ft, and Glen Rose 4200 to 4300 ft. The Red Bed series of the upper part of the lower Cretaceous at 3100 ft produces oil. **Type Structure:** Dome. **Dis-**

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covery Means: Subsurface geology. **Producing Area:** 900 acres productive of oil, gas cap more extensive. **Extent Developed:** Some of this structure is within Barksdale field, government property, and cannot be drilled at this time. Balance not encouraging. **Deepest Test:** Travis Peak non-productive. **Estimated Ultimate Recovery:** 1,150,000 bbls. **Production to 1938:** 145,345 bbls. **Remaining Reserve:** 1,004,655 bbls. **Daily Production Feb. 1, 1938:** 279 bbls from 12 wells. **Gravity:** 39 to 42 degrees. **Rigs Running Feb. 1, 1938:** 2. **Principal Leaseholders:** Arkansas-Louisiana Gas Co., Louisiana Petroleum Corp., Producers Oil Co., Triangle Drilling Co., Union Producing Co. **Pipe Lines:** Arkansas Pipe Line Co., Atlas Pipe Line Co., Union Pipe Line Co. **Remarks:** Basal Glen Rose (Petitt), occurring between Young, deepest of Rodessa producing horizons and the top of the Travis Peak, first produced oil in this field, later in Lisbon. The shallow Nacatoch sand at 850 ft was the most prolific gas strata of the field, accounting for average open flows of 16,000,000 cu ft.

CADDO PARISH

BLANCHARD (Longwood—Gas only)

18n-16w. **Discovery Well:** Gas field discovered in 1927. **Subsequent Discoveries:** Later drilling failed to find oil. **Producing Formation:** Nacatoch 930 ft. Tokio 2750 ft, Travis Peak 5900 ft. **Type Structure:** Dome. **Producing Area:** Undeveloped. **Extent Developed:** Nacatoch production is scattered and not conducive to exploitation. From present indications the Travis Peak may be more evenly distributed and subsequently could more economically be developed. **Deepest Test:** United Gas Public Service Co.'s S. R. Wheeler A-1, 16-18n-16w, 5911 ft in Travis Peak where it showed for 4,400,000 cu ft of wet gas. **Daily Production Feb. 1, 1938:** Gas. **Gravity:** Distillate. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Pyramid Oil & Gas Co., Union Producing Co., Haynes Oil Corp., A. O. Olsen. **Pipe Lines:** United Gas Pipe Line Co.

CADDO (District)

Including Pine Island, Oil City, Morringsport, Ferry Lake, Dixie, Hosston, Vivian. In Townships 20, 21 and 22n, Ranges 14, 15 and 16w, and extending into Texas. **Discovery Well:** Savage Brothers Offenhauser 1, 1-20n-16w, Mar. 28, 1906, as first commercial well in Northern Louisiana. **Subsequent Discoveries:** Normally expanded, with deeper production being proven. **Producing Formations:** Nacatoch at average of 800 ft, Annona chalk 1400 to 1700 ft, Blossom (Buckrange) 2000 ft, Tokio 2200 and 2450 ft, Glen Rose 3600 to 3900 ft, Trinity 6351 ft. **Type Structure:** Series of low domes and anticlines controlled on the north flank of the Sabine Uplift. **Discovery Means:** Early development was through surface geology and seepage. Later development was through subsurface control and trend drilling. **Producing Area:** 60,000 acres. **Extent Developed:** Although field is apparently limited as to areal extent, desirability of production is still resulting in drilling activity. **Deepest Test:** To lower Trinity at 6351 ft. **Estimated Ultimate Recovery:** 175,968,000 bbls. **Production to 1938:** 145,548,000 bbls. **Remaining Reserve:** 30,420,000 bbls. **Daily Production Feb. 1, 1938:** 7491 bbls from 1200 wells. **Gravity:** Shallow strata to 1500 ft, 23-34 degrees; to 1900 ft, 24 degrees; 2200 ft and deeper, 38-43 degrees. **Rigs Running Feb. 1, 1938:** 16. **Principal Leaseholders:** Gulf Refining Co., Arkansas Fuel Oil Co., Falcon Oil Co., Standard Oil Co. of Louisiana, The Texas Co., Louisiana Producing Co., Magnolia Petroleum Co., Ohio Oil Co., E. W. McGoldrick, Stanolind Oil & Gas Co., Simplex Oil Co. **Pipe Lines:** Gulf Refining Co., The Texas Pipe Line Co., Standard Oil Co. of Louisiana, Arkansas Fuel Oil Co., Stanolind Pipe Line Co. **Remarks:** First pipe line from Caddo gas production to Shreveport was laid in the fall of 1905, and in 1908 another line was laid to Texarkana. The 1905-1906 activity in this area is generally credited with fostering North Louisiana development. Normal development subsequent to the first discovery proved the field proper to include other nearby areas of production that had been discovered and developed as separate pools. An arm of production extends into Marion County, Texas.

CEDAR GROVE

17n-13 and 14w. This is a gas field that has been ultimately depleted, no production or operation at this time.

DIXIE (See Caddo)

Township 19n-14w. **Development:** Although individually developed, this area is part of the greater Caddo geologic feature, being an area of flank productivity. Proration limitation in areas of more prolific production has been a spur to renewed activity in this and other shallow sectors, with the result that both inside and edge locations are being drilled and produced without being proportionately expensive.

RODESSA

See also, Rodessa, Miller County, Arkansas; and Rodessa, Cass and Marion Counties, Texas. **Location:** Chiefly in Townships 22 and 23n—15 and 16w, extreme northwest corner of state. Productive area extends unbroken into Arkansas and Texas. **Discovery Well:** R. W. Norton's Hill 1, August 7, 1930, 11,500,000 cu. ft. of gas. **Subsequent Discoveries:** Oil was discovered in 1935 by United Gas Public Service Co., (now Union Prod. Co.), in I. L. Young 1, SE SE 21-23n-16w, 1 mile n of gas production, and later proven to be on the opposite side of the fault. **Producing Formations:** Young-Dees and Gloyd at average of 5900 ft, in the Glen Rose series of lime strata. **Type Structure:** Stratigraphic trap generally following a major fault. **Discovery Means:** Surface geology. Numerous shallow wells prior to discovery of gas indicated feature south of fault. **Producing Area:** 11,400 acres in Louisiana. **Extent Developed:** Considered 90 percent defined within Louisiana with possibilities of fingering accumulation. Tests below the present Glen Rose horizon have been failures, and the northeast-southwest fault defines production to southeast. **Deep-**

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Statement of Condition, March 7, 1938

RESOURCES

Cash and Due from Banks	$30,136,717.28	
U. S. Government Securities	13,732,480.09*	
Other Bonds and Warrants	4,931,193.83*	$48,800,391.20
Loans and Discounts		16,553,795.41
Overdrafts		5,667.94
Income Receivable Accrued		149,901.03
Stock in Federal Reserve Bank		180,000.00
Investment in Bank Premises		2,877,898.37
Customers' Liability under Acceptances		12,764.50
TOTAL		$68,580,418.45

LIABILITIES

Deposits		$62,048,843.85
Acceptances Executed		12,764.50
Income Collected not Earned		57,797.65
Interest, Taxes, etc., Accrued		48,434.84
Reserve for Preferred Dividends		8,375.00
Capital — Preferred	$1,500,000.00	
Capital — Common	2,250,000.00	
Surplus	2,250,000.00	
Undivided Profits and Reserves	404,202.61	6,404,202.61
TOTAL		$68,580,418.45

*Of the total of $18,663,673.92 U. S. Government Securities and Other Bonds and Warrants $13,103,318.71 par value mature within five years.

COMPARATIVE DEPOSITS

March 7, 1934	$33,758,518.69
March 7, 1935	$38,457,011.38
March 7, 1936	$47,749,399.50
March 7, 1937	$52,243,691.95
March 7, 1938	$62,048,843.85

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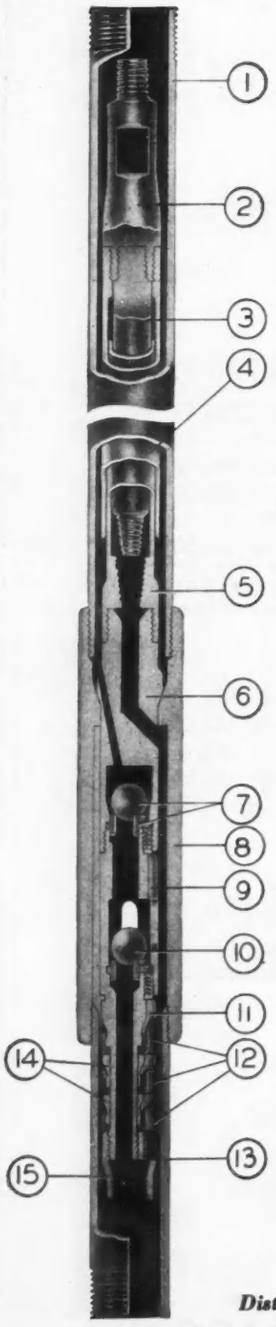

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est Test: To lower Trinity, 11,486 ft. **Estimated Ultimate Recovery:** (Caddo Parish only), 157,000,000 bbls. **Production to 1938:** 38,000,000 bbls. **Remaining Reserve:** 119,000,000 bbls. **Daily Production Feb. 1, 1938:** 43,340 bbls from 446 wells. **Gravity:** 40 degrees to distillate. **Rigs Running Feb. 1, 1938:** 9. **Principal Leaseholders:** W. D. Ambrose, American Liberty Oil Co., G. H. Chablee, Bessie De Mayo, Herman Brown, Gulf Refining Co., W. T. Lacy, H. L. Hunt, R. W. Norton, Ohio Oil Co., Geo. and Mrs. Geo. B. Barham, Fohs Oil Co, Holcomb & Thomason, Grady Vaughn, The Texas Co., Union Producing Co., Superior Oil Co., W. T. Lacy, Tidewater Associated Oil Co., Showers & Moncrief, Spray Oil Co., Heyser-Heard and B. C. Cleary, Mullins & Turner, The Hunter Co., Shell Petroleum Corp., Edmund Key, Arkansas Fuel Oil Co., Standard of La., Magnolia Pet. Co. **Pipe Lines:** East Texas Refining Co., United Gas Public Service Co., Arkansas-Louisiana Natural Gas Co. **Remarks:** The total ultimate recovery of Rodessa, as it is now proven, has been calculated at 293,850,000 bbls; this figure including production in Louisiana, Arkansas and Texas.

CLAIBORNE PARISH

HAYNESVILLE

Centering in Township 23n-8w. **Discovery Well:** Smitherman et al's Taylor 2, 14-23n-8w, Mar. 1921, at 2850 ft in Buckrange sand, 3000 bbls. **Subsequent Discoveries:** Gas, high in gasoline content, was proven in the Glen Rose member of the Trinity in 1926, at 4330 ft. A second oil sand was found below 4500 ft. **Producing Formations:** Blossom from 2800 to 3000 ft, Glen Rose, 4350 ft (gas), and lower Trinity, 4500-4600 ft. **Type Structure:** Anticline. **Discovery Means:** Surface geology. **Producing Area:** 5200 acres. **Extent Developed:** Field is drilled to practical maximum. **Deepest Test:** To lower Glen Rose at 5092 ft. **Estimated Ultimate Recovery:** 104,600,000 bbls. **Production to 1938:** 66,417,800 bbls. **Remaining Reserve:** 38,182,200 bbls. **Daily Production Feb. 1, 1938:** 3000 bbls from 310 wells. **Gravity:** 31-38 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Ohio Oil Co., Arkansas Fuel Oil Co., Miller & Bourn, Shell Petroleum Corp., Magnolia Petroleum Co. **Pipe Lines:** Arkansas Fuel Oil Co., Standard Oil Co. of Louisiana.

HOMER

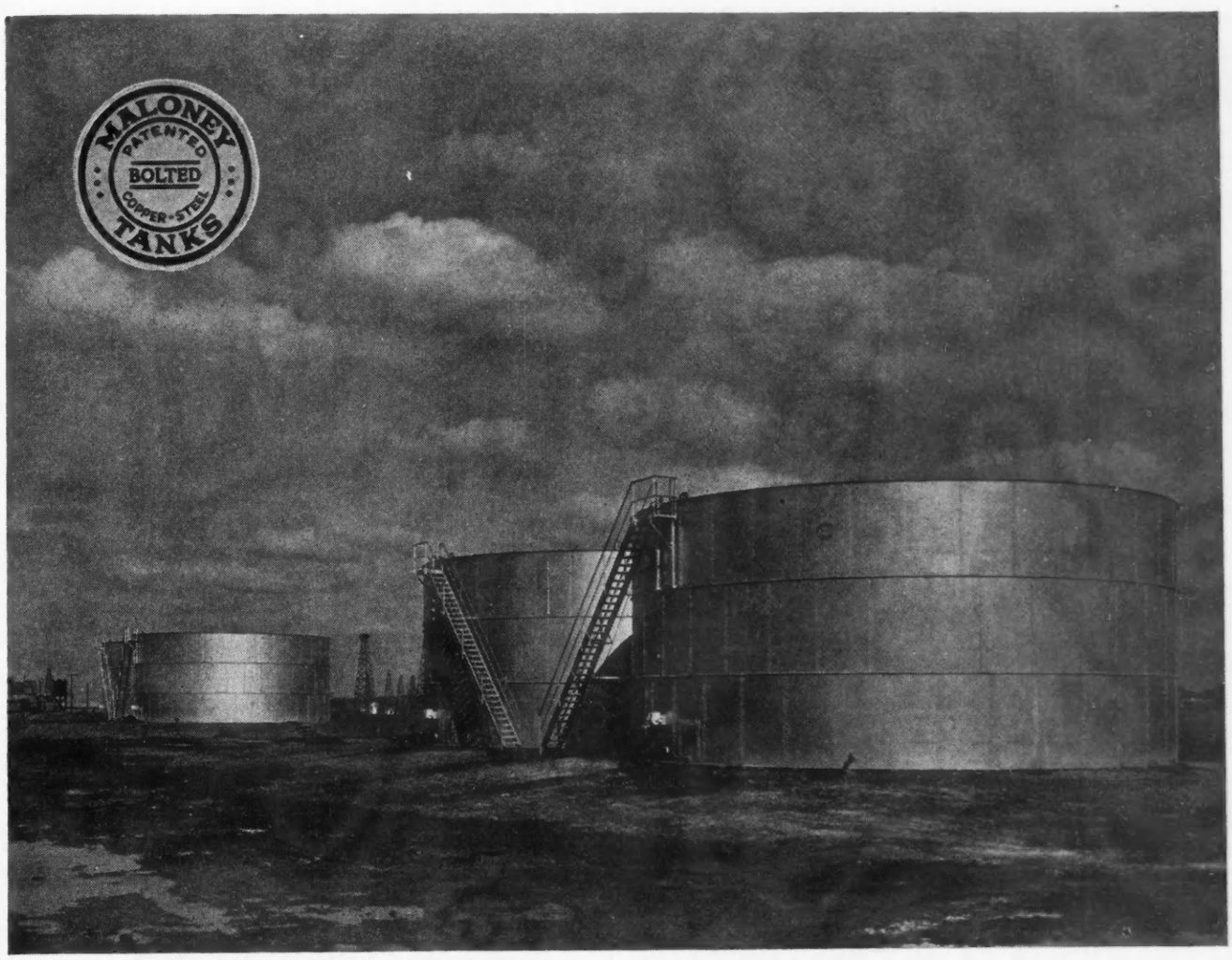
Township 21n-7 and 8w. **Discovery Well:** Consolidated Progressive Oil Co.'s Shaw 1, Jan. 1919. **Subsequent Discoveries:** A lower producing horizon was proven in 1921. **Producing Formation:** Nacatoch sand at 2000 to 2100 ft, and Buckrange, 2750 to 2850 ft. **Type Structure:** Faulted dome. **Discovery Means:** Surface geology. **Producing Area:** 2500 acres. **Extent Developed:** Both sands are completely developed. **Deepest Test:** Glen Rose dry at 4505 ft. **Estimated Ultimate Recovery:** 102,500,000 bbls. **Production to 1938:** 65,889,900 bbls. **Remaining Reserve:** 36,610,100 bbls. **Daily Production Feb. 1, 1938:** 2386 bbls from 335 wells. **Gravity:** 35-36 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Maritzky & Bibby, Gulf Refining Co., Standard Oil Co. of Louisiana, The Texas Co., Tidewater Associated Oil Co., Arkansas Fuel Oil Co. **Pipe Lines:** Arkansas Fuel Oil Co., Gulf Refining Co., Standard Oil Company of Louisiana. **Remarks:** This field has produced greatest per-acre recovery of any field in Tri-State area.

LISBON

Centering in Section 1-20n-5w. **Discovery Well:** E. T. Oakes et al's Patton Estate 2, C NE NE 1-20n-5w, Dec. 25, 1936, 200 bbls. 38 gravity, Basal Glen Rose 5373 ft. **Type Structure:** Flat anticline with porosity an important factor in accumulation, the degree of saturation following porosity more closely than structural contours. Structural condition suggests monoclinic trap. **Discovery Means:** Surface geology, substantiated by wells drilled prior to Patton Estate 1, having favorable shows. **Producing Area:** 4000 acres, undefined. **Extent Developed:** Within the area now producing, the field is approximately 70 percent drilled. Inside locations will be logically drilled on the 20-acre spacing basis. Nearly 90 percent of completions are stimulated with acid. Expanse of productive limits yet to be determined. **Estimated Ultimate Recovery:** 16,000,000 bbls. **Production to 1938:** 2,275,000 bbls. **Remaining Reserve:** 13,725,000 bbls. **Daily Production Feb. 1, 1938:** 10,000 bbls from 173 wells. **Gravity:** 26-34 degrees. **Rigs Running Feb. 1, 1938:** 15. **Principal Leaseholders:** Atlantic Refining Co., Lyons & Neely, R. L. Bauman, F. H. Brown, J. B. Bond, Crescent Drilling Co., DeArman & McMilliam, Delta Drilling Co., Gulf Refining Co., Heath & Moody, Harry Hanbury, Hollyfield & McFarlane, T. L. James Co., Lisbon Oil Co., J. W. & L. P. Love, Love Petroleum Co., Despot & Adams, Magnolia Petroleum Co., Oden & Evans, A. O. Olson, Red Iron Drilling Co., E. W. Gill, Scout Oil Corp., Sells Petroleum Co., Standard Oil Co. of Louisiana, Sloan & Zook, C. R. Schuster, J. C. Tippett, G. H. Vaughn, M. H. Marr. **Pipe Lines:** Gulf Pipe Line Co., Caddo Pipe Line Corp. **Remarks:** One structural theory is that Lisbon is producing from a domal flank, the crest of which is to the north of present development. Some expect it to connect with Sugar Creek to south.

SUGAR CREEK

Centering in Section 6-19n-5w. **Discovery Well:** Triangle Drilling Co.'s Kirkpatrick 1, 1930, 20 mil. ft gas Glen Rose 4400 ft. **Subsequent Discoveries:** United Gas Public Service Co. and Standard Oil Co. of La. found oil and distillate in Travis Peak 5600-5700 ft in Fall 1936. **Type Structure:** Anticlinal Nose. **Discovery Means:** Trend from regional high. **Producing Area:** 160 acres. **Extent Developed:** Undeveloped; high gas/oil ratio. **Estimated Ultimate Recovery:** 4,400,000 bbls. **Production to 1938:** 95,405 bbls. **Remaining Reserve:** 4,304,595 bbls. **Daily Production Feb. 1, 1938:** 315 bbls from 3 wells. **Rigs Running Feb. 1, 1938:** 2. **Principal**



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Slattery Building
SHREVEPORT, LOUISIANA

Leaseholders: Standard Oil Co. of Louisiana, Union Producing Co., Triangle Drilling Co. **Pipe Lines:** Union Producing Co. to loading rack.

DE SOTO PARISH

BENSON

Township 11n-13w. **Remarks:** This is a small spot of production that proved uneconomic to operate and has been abandoned.

DE SOTO

Chiefly in Section 13n-11 and 12w, extending into Red River Parish. **Remarks:** This is considered a portion of Red River, which see for details.

GROGAN (Ramsey)

Section 36-11n-11w. **Discovery Well:** Pullman Oil Co.'s Ramsey 1-A, C 36-11n-11w, July 4, 1937, 150 bbls from Tokio at 2961 ft. **Producing Formation:** Paluxy sand 2960 ft. **Type Structure:** Unknown. **Discovery Means:** Random drilling. **Producing Area:** Undefined, but considered minor. **Extent Developed:** Only two wells, one gas well, one oil well. As area does not promote appeal at this time, further exploration will be slow. **Estimated Ultimate Recovery:** Unestimated. **Production to 1938:** 15,320 bbls. **Daily Production Feb. 1, 1938:** 50 bbls from one well. **Gravity:** 32 degrees. **Rigs Running Feb. 1, 1938.** None. **Principal Leaseholders:** Pullman Oil Co., C. M. Dixon, Leon Johnson, A. F. Schubert, E. L. Radcliff. **Pipe Lines:** Shipment by truck. **Remarks:** Production is about 75 percent water.

HOLLY

Township 13n-13w. **Discovery Well:** R. O. Roy & Co.'s Farmer E-1, C NE NW 5-13n-13w, Nov. 13, 1930, 2500 bbls 39 gravity through ½-inch choke, Woodbine at 2868 ft. **Subsequent Discoveries:** Gas had previously been proven in Jesse Fuller 1 in Section 6, which well made 40,000,000 cubic feet. **Type Structure:** Nosing. **Discovery Means:** Random. **Producing Area:** 220 acres. **Extent Developed:** This pool has been drilled to maximum economic density. **Estimated Ultimate Recovery:** 996,820 bbls. **Production to 1938:** 816,820 bbls. **Remaining Reserve:** 80,000 bbls. **Daily Production Feb. 1, 1938:** 118 bbls from 8 wells. **Gravity:** 39 degrees. **Rigs Running Feb. 1, 1938.** None. **Principal Leaseholders:** Arkansas Fuel Oil Co., Standard Oil Co. of Louisiana. **Pipe Lines:** Standard Oil Co. of Louisiana.

EAST CARROL PARISH

EPPS (Floyd)

Centering in Section 30-20n-11e, on the Parish line with some production in West Carrol Parish, southwest of the heart of the field. **Discovery Well:** Union Producing Co. (was Palmer Corp.'s) O'Brien 1, 7-19n-11w, 1928. **Producing Formation:** Chalk Rock, or Monroe gas Rock, 2300 to 2400 ft, corresponding to Navarro formation of Cretaceous. **Discovery Means:** Surface and subsurface. **Producing Area:** 1800 acres. **Extent Developed:** Field has not been developed to maximum productivity as outlet requirements are limited to demand. **Production to 1938:** Approximately 1,130,000,000 cu. ft. **Daily Production Feb. 1, 1938:** Variable to demand. Open flow gauges exceed 50,000,000 ft maximum. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Union Producing Co. **Pipe Lines:** Local distribution. **Remarks:** Nearby towns of Epps, Oak Grove, Lake Providence, Delhi, Tallulah, etc., are supplied with industrial and domestic fuel from this field.

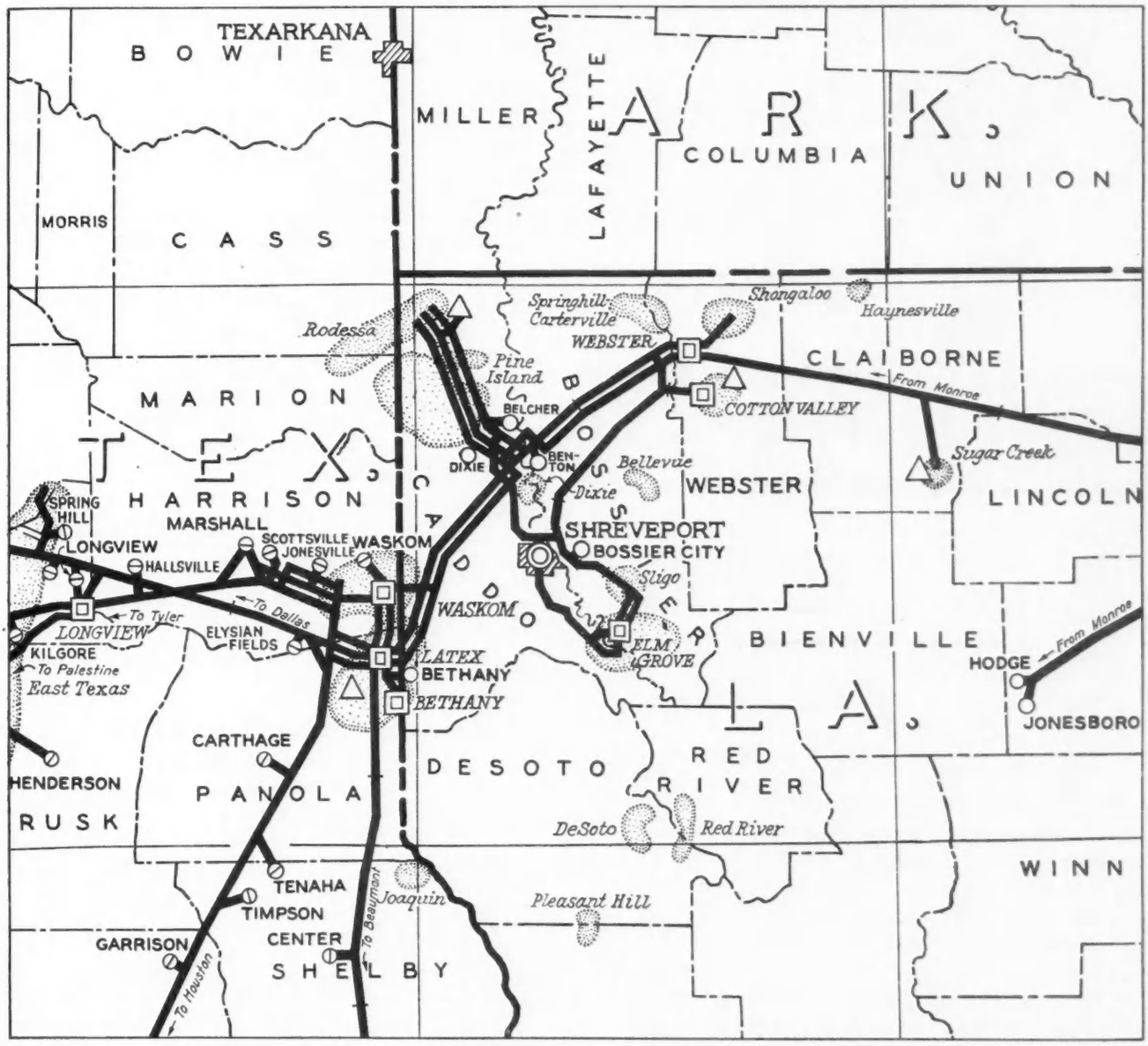
LA SALLE PARISH

URANIA (Tullos)

Township 10n-1 and 2e. **Discovery Well:** Urania Petroleum Company's Urania Lumber Co. 6, 18-10n-2e, March 25, 1925. Same interest's 7, 19-10n-2e, August 4, 1925 was first commercial well, No. 6 having been junked. **Producing Formation:** Can River sand, 1530 ft. **Type Structure:** Monoclinal unconformity. **Discovery Means:** Subsurface correlation resulting from wildcat locations based on surface geology. **Producing Area:** 3,300 acres. **Extent Developed:** Known producing strata area considered defined. **Deepest Test:** Arkansas Fuel Oil Co.'s Urania F-5, 24-10n-1e, dry at 6463 ft. The well logged a very thick Sabine section. **Estimated Ultimate Recovery:** 28,000,000 bbls. **Production to 1938:** 21,358,050 bbls. **Remaining Reserve:** 6,641,950 bbls. **Daily Production Feb. 1, 1938:** 3,200 bbls. from 257 wells. **Gravity:** 19 to 22 degrees. **Rigs Running Feb. 1, 1938:** 2. **Principal Leaseholders:** Air-Lift Oil Co., H. L. Hunt, Inc. **Pipe Lines:** Tank car only. **Remarks:** Although produced fluid is 90 percent salt water, crude net is holding up well. The discovery well of this field came in flowing 800 bbls. per day but soon sanded up. The second producer, Urania Lumber Co. 7, Section 19, was successfully produced. The zone of production,

NATURAL GAS

IN ARK-LA-TEX AREA



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WHITE SULPHUR SPRINGS

Township 7n-2e. **Remarks:** Depleted field covering a small area in southwest La Salle Parish. Wells were not large, barely commercial, and production has been abandoned.

LINCOLN PARISH

MONTCALM (Simsboro)

Township 17n-4w. **Discovery Well:** Lide, Greer, Marr and Brown's Fowler 1, 10-17n-4w, Nov. 26, 1935, 71,400,000 cu. ft. wet gas, Glen Rose 5303 ft. **Subsequent Discoveries:** Same operator's Gardner 1, 10-17n-4w, gas distillate in Travis Peak 6576 ft. **Type Structure:** Narrow anticline. **Producing Area:** Undefined, only two wells. Two failures indicate productive area to be small. **Extent Developed:** Will receive normal, controlled development as future drilling warrants. As control is in hands of single operator, competition will not encourage swift-paced activity. **Deepest Test:** To 6576 ft. See above. **Gravity:** Both horizons produce distillate, gas being wet. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Arkansas-Louisiana Gas Co. **Pipe Lines:** Arkansas-Louisiana Gas Co. **Remarks:** Glen Rose rock pressure, 2100 pounds; Travis Peak, 2600 pounds per square inch.

RUSTON

Section 32-19n-2w. **Discovery Well:** Lide & Greer's Causey 1, 32-19n-2w, showed for distillate and some salt water in Glen Rose 5822 ft. Added development was not encouraged. **Principal Leaseholders:** Lide & Greer, Arkansas-Louisiana Gas Co.

MOREHOUSE PARISH

MONROE

–See Union Parish

OUACHITA PARISH

MONROE

–See Union Parish

RED RIVER PARISH

RED RIVER (Bull Bayou—Crichton)

In Township 12 and 13n, and 11w, in both Red River and DeSoto Parishes. **Discovery Well:** Completed in 1912 for gas at 800 feet. This was lead discovery for Naborton, Abington, Crichton and Bull Bayou, which subsequent development proved to be single, productive area. **Subsequent Discoveries:** Oil was not discovered until 1913. Other wells followed, extending the crude area. **Producing Formations:** Nacatoch at 800 ft., Chalk Rock, Tokio, Glen Rose at 3577 ft. **Type Structure:** Faulted anticline. **Discovery Means:** Surface geology, with subsequent extensions due to random and trend drilling. **Producing Area:** 5,000 acres. **Extent Developed:** Considered defined as to extent, and being normally depleted. **Deepest Test:** To 6141 ft. in Glen Rose. **Estimated Ultimate Recovery:** 64,220,310 bbls. **Production to 1938:** 55,220,310 bbls. **Remaining Reserve:** 9,000,000 bbls. **Daily Production Feb. 1, 1938:** 1425 bbls., 158 wells. **Gravity:** Varying from 36 to 44 with strata and depth. **Rigs Running Feb. 1, 1938:** 10. **Principal Leaseholders:** Gulf Refining Co., Triple Oil Co., Bradford Oil Corp., Circle W Oil Co., Magnolia Petroleum Co., J. K. & S. L. Wadley, The Texas Co. **Pipe Lines:** Gulf Refining Co., Magnolia Pipe Line Co.

RICHLAND PARISH

RICHLAND

Chiefly in Townships 16 and 17n-6e. **Discovery Well:** Gulf Refining Co.'s England Planting Co. 1, 32-17w-6e, Dec., 1926. **Subsequent Discoveries:** Some gas production is obtained in the northwest sector of the field from Chalk-Rock, or Monroe Gas Rock, but is relatively unimportant. **Producing Formation:** Tokio sand, (Woodbine or basal Upper Cretaceous) produces major portion of gas from unconformable position beneath Midway Eocene, 2300 to 2500 ft. Eubanks sand is a deep, partially developed, pay. **Discovery Means:** Surface geology. **Producing Area:** 21,000 acres. **Extent Developed:** Development of field, in common with other gas areas, has closely paralleled demand of outlet facilities. Area has passed 100 percent development stage and is going toward depletion. **Production to 1938:** During 1937, field produced slightly over 8,000,000,000 cu. ft. gas. **Daily Production Feb. 1, 1938:** 18,000,000 from 96 wells, with abandonment following exhaustion. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** United

You Can't Tie Fun!

We are told that Ark-La-Tex is the greatest oil producing area on earth. Facts, figures and maps in this issue of the Oil Weekly will undoubtedly bear out that contention.

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GROGAN OIL COMPANY

Shreveport, Louisiana

Gas Producing Co., Interstate Natural Gas Co., Southern Carbon Co. **Pipe Lines:** As area is adjacent Monroe, outlets are generally inter-connected.

SABINE PARISH

BLUE LAKE (West Zwolle)

Township 76-13 and 14w, near Texas line. **Producing Formation:** Contact and reworked sections of gray Marl, Nacatoch sand, Saratoga and Annona Chalks. **Type Structure:** Flank accumulation, southeast of controlling Sabine Uplift, with production dependent upon porosity of formation. Area closely related geologically with Zwolle field to northeast. Anticlinal nosing. **Extent Developed:** Five shallow producers completed in the field were abandoned in 1932 when production dwindled to an uneconomic level. Development centered in 14-7n-14w. **Deepest Test:** See Zwolle. **Principal Leaseholders:** See Zwolle.

CONVERSE

Township 9n-13w. **Discovery Well:** Gibson and Johnson's Frost Lumber Co. 1, nw se 19-9n-13w, Oct. 4, 1932, 50 bbls from 1626 ft. **Subsequent Discoveries:** Field developed through normal expansion of productive area. **Producing Formations:** Nacatoch sandy lime, 1530 ft; Saratoga chalk, 1625 ft; Annona chalk, 1900 ft; above lower-upper Cretaceous contact at 3150 ft; and gas from Lower Cretaceous at 3400 ft. **Type Structure:** Domal flanking accumulation. **Discovery Means:** Random wildcat that proved area favorable. **Producing Area:** 1610 acres. **Extent Developed:** Apparently defined as to area. **Estimated Ultimate Recovery:** 5,025,000 bbls. **Production to 1938:** 1,621,505 bbls. **Remaining Reserve:** 3,403,495 bbls. **Daily Production Feb. 1, 1938:** 640 bbls from 82 wells. **Gravity:** 28-32 and about 47 degrees from deep pay. **Rigs Running Feb. 1, 1938:** 2. **Principal Leaseholders:** Earle P. Halliburton, Hill Meyers, Circle W Oil Corp., Gehrig Co., W. W. MacDonald, G. H. Collins, et al. **Pipe Lines:** Standard Oil Co. of Louisiana. **Remarks:** Acid treatment is successfully applied in this field, both to stimulate old wells and to increase initial productivity.

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SHREVEPORT **LOUISIANA**

PLEASANT HILL

Township 10n-12w. **Discovery Well:** Arkansas Fuel Oil Co.'s Logan Oil Co. 1, ne nw ne 33-10n-12w, Feb. 3, 1927, for 513 bbls from 3210 ft. **Formation Producing:** Washita sand from 3180 to 3250 ft. **Type Structure:** Anticline. **Discovery Means:** Surface geology. **Producing Area:** 580 acres. **Extent Developed:** To maximum economic density. **Estimated Ultimate Recovery:** 574,000 bbls. **Production to 1938:** 424,535 bbls. **Remaining Reserve:** 149,465 bbls. **Daily Production Feb. 1, 1938:** 110 bbls from 26 wells. **Gravity:** 41 to 42 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Arkansas Fuel Oil Co., J. K. Wadley. **Pipe Lines:** Standard Oil Co. of Louisiana. **Remarks:** Some production obtained from a test drilled years earlier than above.

SPRING RIDGE

Township 9n-11w. **Remarks:** This is a one-well pool, abandoned by first operator, now being produced by landowner, Stephens, at rate of about 8 barrels per day.

ZWOLLE

Covering parts of Townships 7 & 8n-10-11-12-13w, extreme western Louisiana. **Discovery Well:** R. L. Gay, Trustee's Bowman-Hicks Lumber Co. A-1, 36-8n-12w, Nov. 28, 1929. **Subsequent Discoveries:** General expansion and deeper drilling. **Producing Formation:** Contact and reworked sections of gray marl, Nacatoch sand, and Saratoga and Annona chalks; the chalk formation being the strata most prolific. Depths range from 2260 to 2500 ft. **Type Structure:** Flank accumulation, southeast of the controlling feature of the area, the Sabine Uplift. Accumulation, and hence the production, is dependent upon degree of porosity. Faulted anticlinal high. **Discovery Means:** Geology. **Producing Area:** 60,000 acres. **Extent Developed:** Productive area is considered defined as to known occurrences of strata having sufficient porosity to produce. Adjacent production might be obtained, although from extent of prospecting already done, any subsequent discoveries should be minor. **Deepest Test:** A. H. Tarver's Baker A-2, nw cor ne 36-8n-12w, abn 6200 ft. **Estimated Ultimate Recovery:** 18,392,000 bbls. **Production to 1938:** 12,992,500 bbls. **Remaining Reserve:** 5,399,500 bbls. **Daily Production Feb. 1, 1938:** 870 bbls from 66 wells. **Gravity:** 41-42 degrees. **Rigs Running Feb. 1, 1938:** 3. **Principal Leaseholders:** The Hunter Co., L. Lieber Loring Oil Co. Magnolia Petroleum Co., Ohio Oil Co., The Texas Co., George Pace. **Pipe Lines:** Standard Oil Co. of Louisiana. **Remarks:** Peak of production was reached in 1933—2,354,841 bbls.

UNION PARISH

MONROE

Centering approximately at the Tri-Parish junction in Township 20n-4e, and spreading almost equally in Morehouse, Ouachita and Union parishes. **Discovery Well:** Progressive Oil & Gas Co.'s Fisher 1, 37-20n-5e, gas well, 1916. **Subsequent Discoveries:** Great expanse of the field became apparent through normal exploration, spurred by effort to find associated crude production. **Producing Formation:** "Monroe gas rock," (or, chalk series) a section of the Navarro formation of the Cretaceous, at average of 2100 ft. **Type Structure:** Flat dome. **Discovery Means:** Surface geology. **Producing Area:** Present known drainage area is limited to a little less than 400 sections, or approximately 260,000 acres known reserve. **Extent Developed:** This area is drilled to an average of 70 percent density, with early productive sector closely drilled. **Deepest Test:** Federal Petroleum Co. drilled to 7000 ft in 34-21n-3e, northwest section of field, abd. **Estimated Ultimate Recovery:** 4,200,000,000,000 cu ft. **Production to 1938:** 2,300,000,000,000 cu ft. **Remaining Reserve:** 1,900,000,000,000 cu ft. **Daily Production Feb. 1, 1938:** 565,000,000 cu ft from 1145 wells. **Rigs Running Feb. 1, 1938:** 4. **Principal Leaseholders:** United Gas Public Service Co., United Carbon Co., Southern Carbon Co., Interstate Natural Gas Co. **Pipe Lines:** Mississippi River Fuel Corp., Southern Natural Gas Corp., Memphis Natural Gas Co., Magnolia Gas Co., Arkansas-Louisiana Pipe Line Co., Interstate Natural Gas Co., Southern Gas & Fuel Co., Northwest Louisiana Natural Gas Co.

OAKLAND

Township 23n-1e. **Producing Area:** 160 acres. **Extent Developed:** Additional development seems doubtful for near future. Past producers, abandoned, were recently rejuvinated by a new operator, but this production has been temporarily shut in.

WEBSTER PARISH

COTTON VALLEY

Township 21n-10w. **Discovery Well:** Dr. R. D. Webb et al's Merritt 1, 13-21n-10w, Aug. 22, 1922, 25,000 cu ft gas. Oil Fields Gas Co's Merritt 1, 14-21-10n proved the field for oil by making 280 barrels initial, 1924. **Subsequent Discoveries:** In 1926 a rich gas sand was

proven in Anhydrite zone of Glen Rose at 4378 ft, and in 1928 oil production of minor character discovered in sand underlying Anhydrite. In 1935, Ohio Oil Co's R. L. Holloway 6, 23-21n-10w, oil in Travis Peak at 5500 ft. In 1937, Ohio Oil Co's Bodcaw 1, 28-21-10w, opened distillate production in Lower Marine at 8189 ft. **Type Structure:** Anticlinal fold. **Discovery Means:** Surface geology with subsurface correlation. **Producing Area:** Proven area of deep production exceeds 2500 acres. **Extent Developed:** The deep wells producing from the gas-distillate zone of Lower Marine below 8000 ft have not indicated any limitation of the productive area with the result that some engineers have rated the field as the largest reserve in Louisiana. **Deepest Test:** A well near the center of the field, drilled by Ohio Oil Co, penetrated lower Trinity Red Beds to 8565 ft. Here a good show of oil was encountered but the well was plugged back. **Estimated Ultimate Recovery:** 63,000,000 bbls. **Production to 1938:** 15,538,650 bbls. **Remaining Reserve:** 47,461,650 bbls. **Daily Production Feb. 1, 1938:** 4100 bbls, including distillate, from 106 wells. **Gravity:** 28-32 degrees, shallow production, deep production is distillate. **Rigs Running Feb. 1, 1938:** 15, with activity increasing. **Principal Leaseholders:** H. L. Hunt, W. G. Ray, Bay Oil Co, Magnolia Petroleum Co, Ohio Oil Co, Union Producing Co, Woodley Petroleum Co, Standard Oil Co of Louisiana, Superior Oil Co. **Pipe Lines:** Standard Oil Co of Louisiana, Arkansas Fuel Oil Co, Magnolia Pipe Line Co. **Remarks:** Deep wells are being drilled on 80-acre spacing plan. No deep failures have been completed. An unsuccessful effort was made in the early 20's to cause crude to migrate from the outer oil area to the shallow inner gas area by allowing the pressure of the gas wells to blow down to atmosphere. The attempt failed, and the practice has since been proven vastly detrimental to both normal conservation and ultimate recovery.

SHONGALOO

Centering in Section 1-22n-10w. **Discovery Well:** Discovered in 1920 and developed as a gas field. **Subsequent Discoveries:** Small area of crude production proven. **Type Structure:** Anticline. **Discovery Means:** Surface geology. **Producing Formation:** Sandy lime, 2600 to 2700 ft. **Extent Developed:** Delimited and virtually exhausted as to oil possibilities. **Deepest Test:** Magnolia Petroleum Co drilling deep test in 32-23n-9w, proposed to 9000 ft. **Estimated Ultimate Recovery:** 107,880 bbls. **Production to 1938:** 107,880 bbls. **Remaining Reserve:** 0 bbls. **Daily Production Feb. 1, 1938:** No oil. **Gravity:** 28-30 degrees. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Ohio Oil Co, Magnolia Petroleum Co.

SIBLEY (Dubberly)

Section 35-18n-9w. **Discovery Well:** J. P. Evans' Crichton 1, 35-18n-9w, May 22, 1936. **Producing Formation:** Glen Rose lime, 5550 to 5600 ft. **Type Structure:** Domal high. **Discovery Means:** Combined surface and geophysical. **Producing Area:** 160 acres, undefined. **Extent Developed:** Undeveloped; wet gas showing salt water not conducive to extended development. **Daily Production Feb. 1, 1938:** 30 bbls from 3 wells while being operated, although shut in through lack of outlet. **Gravity:** Distillate. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** J. P. Evans.

EAST TEXAS

EAST TEXAS FIELD

Rusk, Gregg, Upshur, Smith and Cherokee Counties. **Discovery Well:** Hunt Oil Co (was C. M. Joiner et al's) Daisy M. Bradford 3-a, 2000 varas from N and 2500 varas from W lines of Juan Ximines Sur, Oct. 3, 1930, from broken Woodbine at 3536-92 ft, flowing by heads and later a maximum of 458 bbls daily. **Means of Discovery:** Random exploration. **Type Structure:** Sand deposition along the east flank of the East Texas Woodbine basin and juncture of the Sabine Uplift. **Producing Formation:** Woodbine, varying from a minimum 3390 ft to maximum 3900 ft, with bottom-hole water generally prevalent below 3320 ft sub-sea. **Producing Area:** 133,000 acres. **Extent of Development:** Defined, but experiencing intensive inside drilling. **Deepest Test:** Humble Oil & Refining Co and Gulf Oil Corp's E. D. Robertson 1 on 11.4-acre lease, Marshall Mann Survey, Gregg County, 4 miles east of Woodbine production, drilling at 9160 ft in hard sand. **Estimated Ultimate Recovery:** 3,250,000,000 bbls. **Production Through 1937:** 1,158,500,000 bbls. **Indicated Remaining Reserve:** 2,091,500,000 bbls. **Daily Production March 1, 1938:** 498,327 bbls; 24,635 wells rated at 14,881,797 bbls per hour, with 102 accounted for dormant wells and 18 idle wells. **Gravity:** 38-40 degrees. **Oil Outlet:** 70 gathering systems; 10 majors operate one or more trunk lines and one natural gasoline pipe line; 3 independents operate trunk lines that deliver to the Texas Coast and one to Shreveport, La. **Rigs Running March 1, 1938:** 62 with a total of 127 operations. **Principal Leaseholders:** Approximately 1050 separate operating units, including 14 majors, and the latter hold 59.86 percent of the producing area. Field has 3800 separate producing leases. **Remarks:** Development around discovery area expanded rapidly fore part 1931. Completion of Ed. W. Bateman et al's L. D. Crim 1, Dec. 28, 1930, near north line of Rusk County in Kilgore area, and J. E. Farrell, W. A. Moncrief-E. A. Showers and Arkansas Fuel Oil Co's F. K. Lathrop 1, Jan. 26, 1931, northern Gregg County in Longview area, indicated an immense producing area. Operators proceeded to link the 3 areas, and in Oct., 1931, field activity reached a peak level of 886 operations, including 461 drilling tests. This record was preceded by the staking of 195 locations in a single week. Proration allowable of the field reached a peak of 826,895 bbls daily from 10,030 wells in May, 1933, but actual production was approximately 1,400,000 bbls daily at this period due to ineffective proration enforcement. In excess of 110,000,000 bbls of oil was produced up to Jan. 1, 1938, above proration allowables, and the bulk of this is classed as "hot oil." The field has a maximum width of 9¾ miles, and continuous production prevails along a northeast-southwest course for a distance of 42.84 miles. Exclusive of the ends, the narrowest width is 3.69 miles near the middle and south of Kilgore.

ANDERSON COUNTY

BOGGY CREEK

Fifteen miles west by south of Jacksonville. **Discovery Well:** Humble Oil & Refining Co.'s Elliott-Clark 1, 1638 ft W and 400 ft S of northeast corner of M. Windsor Survey, Cherokee County, Mar. 21, 1927, 759 bbls 38 gravity oil 12 hrs, ¼-in choke, from Woodbine, 3841-49 ft. **Type Structure:** Fault. **Discovery Means:** Core tests and surface geology. **Producing Area:** 1000 acres. **Extent Developed:** Production defined. **Estimated Ultimate Recovery:** 5,000,000 bbls. **Production to 1938:** 4,644,000 bbls. **Remaining Reserve:** 356,000 bbls. **Daily Production March 1, 1938:** 400 bbls; 21 wells; potential 1035 bbls. **Gravity:** 38. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Humble Oil & Refining Co. **Pipe Lines:** Humble Pipe Line Co. **Remarks:** Humble drilled 30 oil wells, 21 gassers and 30 dry holes. Other interests drilled 1 oil well and 2 failures.

CAMP HILL (Sub-Clarksville Sand)

Four and one-half miles northeast of Elkhart. **Discovery Well:** Gulf Oil Corp.'s T. Royall-M. A. Davey 1, 330 feet out of NWc of 174-acre lease, M. Rogers Survey, Jan. 31, 1935, 10,000,000 ft gas with oil spray from Sub-Clarksville sand at 5058-5059 ft after plugging back from Georgetown lime, 5948-69 ft. **Means of Discovery:** Geophysical and subsurface. **Type Structure:** Faulted dome. **Producing Formation:** Sub-Clarksville, found immediately below Austin chalk. **Producing Area:** 200 acres. **Extent of Development:** Defined and depleted. **Deepest Test:** Gulf Oil Corp.'s M. J. Ross 1, SEc 54.7-acre lease, Robt. Erwin Survey, abnd in lower Glen Rose, carrying salt water, 8383 ft, Sept. 10, 1936. **Production Through 1937:** 285,149 bbls, including output of 3 depleted Woodbine sand wells. **Indicated Remaining Reserve:** None. **Gravity:** 38-39 degrees. **Oil Outlet:** Gulf Refining Co. (dismantled). **Principal Leaseholders:** Gulf Oil Corp. and Sun Oil Co. **Remarks:** Discovery supplied gas fuel for drilling of deep test and converted into oil well, making peak flow of 160 bbls daily on ⅜-inch choke. Later development yielded 3 flowing producers from Woodbine, making total of 10 producing oil wells. All wells plugged Oct., 1937.

CAMP HILL (Woodbine)

Four and one-half miles northeast of of Elkhart. **Discovery Well:** Gulf Oil Corp.'s J. M. Delaney 1, near northwest corner 174.2-acre lease, Phillip Martin Survey, June 15, 1935, 201 bbls, ¼-inch choke, Woodbine, 5177-5181 ft. **Means of Discovery:** Routine exploration below Sub-Clarksville sand. **Type Structure:** Faulted dome. **Producing Formation:** Woodbine sand underlying Sub-Clarksville. **Producing Area:** (Overlapped Sub-Clarksville zone.) **Extent of Development:** Defined and depleted. **Deepest Test:** (Listed under Camp Hill's Sub-Clarksville sketch.) **Production Through 1937:** (Listed under Camp Hill's Sub-Clarksville.) **Indicated Remaining Reserve:** None. **Gravity:** 38-39 degrees. **Remarks:** All wells depleted and plugged Oct., 1937.

CAYUGA

Near common corner of Anderson, Freestone and Henderson Counties, and extending into all three. **Discovery Well:** Tide Water Associated Oil Co-Seaboard Oil Corp's Fee (J. N. Edens) 1, 1400 ft from north and east lines of 988.6-acre lease and (north) Samuel Snider Survey, March 1, 1934, 110 bbls per hour through two ¾-inch chokes on tubing from Woodbine sand 4082-88 ft. **Type Structure:** Dome. **Discovery Means:** Geophysical. **Producing Area:** 4500 acres oil and 12,500 acres oil-gas and gas. **Extent Developed:** Defined, but affords considerable inside drilling on large leases. **Deepest Test:** (Listed under Cayuga deep). **Gas Production:** (Listed under Cayuga deep). **Estimated Ultimate Recovery:** 60,000,000 bbls. **Production to 1938:** 7,253,600 bbls, exclusive of 79,900 bbls distillate produced in 1937. **Remaining Reserve:** 52,746,400 bbls. **Daily Production March 1, 1938:** 9,989 bbls: 245 wells rated at 25,326 bbls potential on ⅛-inch choke. **Gravity:** 28-30 degrees. **Rigs Running March 1, 1938:** 4. **Principal Leaseholders:** Allison Production Co, Cortex Petroleum Co, Roeser & Pendleton, Inc., Stanolind Oil & Gas Co, Tide Water Associated Oil Co-Seaboard Oil Corp, and Joe A. Worsham, Trustee, and 24 smaller operating units. **Pipe Lines:** The Texas Pipe Line Co. **Gas Lines:** Lone Star Gas Co and Athens Natural Gas Co. **Remarks:** Oil is generally obtainable from comparatively thin sand section immediately above the water level. Wells favorably situated on the structure log about 200 ft of Woodbine, carrying prolific gas production, above the oil level. Pipe must be cemented below this gas to attain low gas/oil ratio, and if upper gas breaks through the wells convert into gassers with light spray of crude. Restricted oil withdrawal and enforcement of gas/oil ratio rules imperative for

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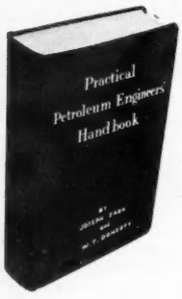

By JOSEPH ZABA, E. M. M. Sc.
Petroleum Engineer, Rio Bravo Oil Company
and
W. T. DOHERTY
Division Superintendent,
Humble Oil & Refining Company

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TABLE OF CONTENTS

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profitable operations. Restricted market for gas does not enable operators to amortize cost of gas wells within a reasonable period.

CAYUGA (deep)

Discovery Well: Tide Water Associated Oil Co and Seaboard Oil Corp's Wills 21-A, 2333 ft from W and 4079 ft from N lines of 832.29-acre lease, Edmondson Survey, within Woodbine producing area, Nov. 6, 1935, 150 bbls distillate and 6,800,000 ft gas, on ½-inch tubing choke. Closed tubing pressure 3025 lbs; casing 3150 lbs. **Means of Discovery:** Deep drilling in established oil and gas field. **Type Structure:** Dome. **Producing Formation:** Lower Glen Rose through gun-perforated casing after plugging back to 7395 ft from Travis Peak section at 7990-9085 ft. **Extent of Development:** Second prolific gas-distillate well, 7000 ft SW discovery, and a failure in the same horizon on the west edge of the dome, constitutes the only lower Trinity explorations. **Production Through 1937:** 27,724,000,000 cu ft gas from 34 wells, including the 2 deep producers. Woodbine wells predominated as gas source. **Daily Production March 1, 1938:** Varies with market demand, which amounted to 9,180,160,000 cu ft total in 1937. **Gravity:** (Distillate) 56-58 degrees. **Distillate Outlet:** The Texas Pipe Line Co and H. L. Hunt. **Gas Outlet:** Lone Star Gas Co and Athens Natural Gas Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Discovery partnership. **Remarks:** Owners of the 2 gas-distillate wells in the lower Trinity have had an attractive return on the deep-well investment through natural gas sales contract, and the exemption of distillate production from proration while making gas deliveries. However, the natural gas market, which is shared by the partnership's Woodbine gas production, is not adequate to justify continued development of the lower Trinity.

ELKHART

Five mi sw of Elkhart. **Discovery Well:** H. L. Parsons and American-Liberty Oil Co.'s H. B. Hemby 1, 600 ft from N and 1000 ft from W lines of 213-acre tract, John Gossett Survey, Jan. 16, 1938. 45,000,000 ft sweet gas and 35 bbls distillate. **Means of Discovery:** Surface geology and geophysical surveys. **Type Structure:** Dome. **Producing Formation:** Woodbine topped at 5360 ft, drilled to 5487 ft, plugged back to 5421 ft and gun-perforated casing 5409-19 ft. **Producing Area:** 1-well pool. **Deepest Test:** Gulf and Humble's O. G. Rogers 1, NWc 267½-acre lease, Daniel Parker survey, SE of discovery, abnd May 3, 1935, Woodbine section at 5486-5773 ft after testing salt water. **Daily Production March 1, 1938:** Shut in. **Gravity:** (Distillate) 58 degrees. **Oil Outlet:** None. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** H. L. Parsons-American Liberty Oil Co., Gulf Oil Corp., Humble Oil & Refining Co., Magnolia Petroleum Co., Shell Petroleum Corp., and Sun Oil Co. **Remarks:** Discovery well shut in after preliminary test due to absence of pipe line connection and market demand for gas. Until market is available for the gas production future development will be held in abeyance.

LONG LAKE

Southwest part of county on line of Freestone at corner of Leon County. **Discovery Well:** Tide Water Associated Oil Co and Seaboard Oil Corp's Monnig Bros. 1, 3700 ft south of SWc of Tom Reeves, Jr. 97.06-acre tract and 4200 ft west of west bank of Trinity River, but on 3806.82-acre lease, Simon Sanchez Survey No. 1-11, Oct. 14, 1933, in Woodbine at 5240-98 ft after plugging back from 5468½ ft, rated at 100 bbls and 11,000,000 ft gas. **Means of Discovery:** Geophysical surveys. **Type Structure:** Dome. **Producing Formation:** Woodbine. **Producing Area:** 1200 acres oil and 15,000 acres of oil-gas and gas. **Extent of Development:** Sparsely drilled due to restricted gas market, and hazard of scoring unprofitable gas production instead of oil production. **Deepest Test:** Tide Water Associated and Seaboard's Monnig Bros. 7, S. Sanchez Survey 1-11, no shows in lower Trinity, logged top of Pettit sand 9590 ft, top Travis Peak 9930 ft, abn June 2, 1937, 9971 ft, deepest test in Woodbine basin. **Estimated Ultimate Recovery:** 6,000,000 bbls. **Production Through 1937:** 914,200 bbls, exclusive of 286,000 bbls distillate. **Indicated Remaining Reserve:** 5,085,800 bbls. **Gas Production Through 1937:** 20,270,000,000 cu ft: 31 gassers. **Daily Production March 1, 1938:** 1658 bbls, 49 wells prorated to 39 bbls daily. **Gravity:** 38-42 degrees. **Oil Outlet:** Gulf Refining Co. **Gas Outlet:** Lone Star Gas Co. **Gas Production March 1, 1938:** Varies with market demand; 7,261,000,000 cu ft in 1937. **Rigs Running March 1, 1938:** 3. **Principal Leaseholders:** Tide Water Associated Oil Co-Seaboard Oil Corp, Hunt Oil Co, F-H-E Oil Co, Byrd & Frost, Alex McCutchin et al, Stanolind Oil & Gas Co, The Texas Co, Neversuch Oil Co, W. R. Adams et al, C. L. Mahaney et al. **Remarks:** Long Lake is primarily a gas field, with oil present close to the water level near the rim of the dome. Prolific gas production found in upper Woodbine section makes it necessary to land casing at gas-oil contact, and if the big gas breaks through the well converts into a gasser. The discovery well changed to a gasser shortly after going on steady production.

CASS COUNTY

RODESSA

See also Rodessa, Marion County, Texas, Rodessa, Caddo Parish, Louisiana and Rodessa, Miller County, Arkansas.

Extreme southeastern section of County, and into Marion County, which see. Production unbroken extensions into Arkansas and Louisiana. First extension Rodessa into Texas was in Cass County.

CHEROKEE COUNTY

RUSK

Seven miles southwest Rusk. **Discovery Well:** T. J. Wood and Young's New Birmingham Development Co.-Shell 1, 150 ft out of NWc of 160-acre lse, Levi Jordan Survey, June 3, 1934. **Means of Discovery:** Geology. **Type Structure:** Shoreline accumulation. **Pro-**

ducing Formation: Woodbine at 5116-18½ ft, flowed 30 bbls hourly ¾-inch choke, developed water, then plugged back, sidetracked and re-completed from sand at 5121-24 ft. **Producing Area:** 40 acres, based upon 3 producers on discovery site and an isolated producer. **Extent of Development:** Partially defined, with sufficient dry holes to discourage new development. **Estimated Ultimate Recovery:** 600,000 bbls. **Production Through 1937:** 247,000 bbls. **Indicated Remaining Reserve:** 353,000 bbls. **Daily Production March 1, 1938:** 93 bbls, 3 wells having combined potential of 93 bbls. **Gravity:** 40-41. **Oil Outlet:** The Texas Pipe Line Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** T. J. Wood, L. O. McMillan et al, T. J. Wood and Young, Shell Petroleum Corp., Sinclair Prairie Oil Co. and Sun Oil Co. **Remarks:** Discovery well caused aggressive lease play at high prices throughout the area. Dry holes and high percentage of water handled by producing wells caused all but the discovery group to withdrawal. However, additional development planned to south of discovery lease.

FREESTONE COUNTY

RED LAKE

3½ miles SE Turlington. **Discovery Well:** J. B. Daniel Oil & Royalty Co's P. D. C. Ball-Shell 1, 1890 ft from W and 10,380 ft from S lines of J. Y. Aguilera Survey No. 2, May 18, 1934, 80,000,000 cu ft daily, with spray of distillate, from sand, topped at 4844 ft, drilled to 5003 ft, plugged back to 4854 ft. **Means of Discovery:** Geology and geophysics. **Type Structure:** Dome. **Producing Formation:** Woodbine series. **Producing Area:** 3-well pool. **Extent of Development:** Insufficient tests made to ascertain producing area. **Gas Production Through 1937:** 1,040,400,000 cu ft. **Daily Gas Production March 1, 1938:** Varies with market demand; 412,967,000 cu ft in 1937. **Gas Outlet:** Lone Star Gas Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** J. B. Daniel Oil & Royalty Co, Shell Petroleum Corp. **Remarks:** Market outlet for gas production provided in August, 1935. Field produced 412,967,000 cu ft of gas and 685 bbls distillate in 1937. Market outlet cannot be expanded sufficiently to justify continued development of area.

HARRISON COUNTY

WASKOM (Gas)

Center east line of county. **Discovery Well:** Fuller & Scott's Furrh 1, completed 1924. **Producing Formation:** Blossom at 1700 to 1800 and Nacatoch from 800 to 890 ft, contact of Washita-Fredericksburg, 2300 ft; Adams sand, 2650; Augurs, lenticular sand from 2900 to 3300 ft. **Type Structure:** Minor high on Sabine Uplift. **Discovery Means:** Surface geology and random drilling. **Producing Area:** 11,000 acres. **Extent Developed:** Uneconomic production; light and slight recovery. Further development depends upon increased market for gas or discovery more crude. Initial oil recovery as high as 15 bbls per well quickly dwindled. **Estimated Ultimate Recovery:** Three chief productive sands 90 percent depleted. **Daily Production Feb. 1, 1938:** 4,000,000 cu ft from 79 wells. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Unitde Gas Producing Co, Arkansas-Louisiana Gas Co. **Pipe Lines:** United Gas Producing Co, Arkansas-Louisiana Gas Co.

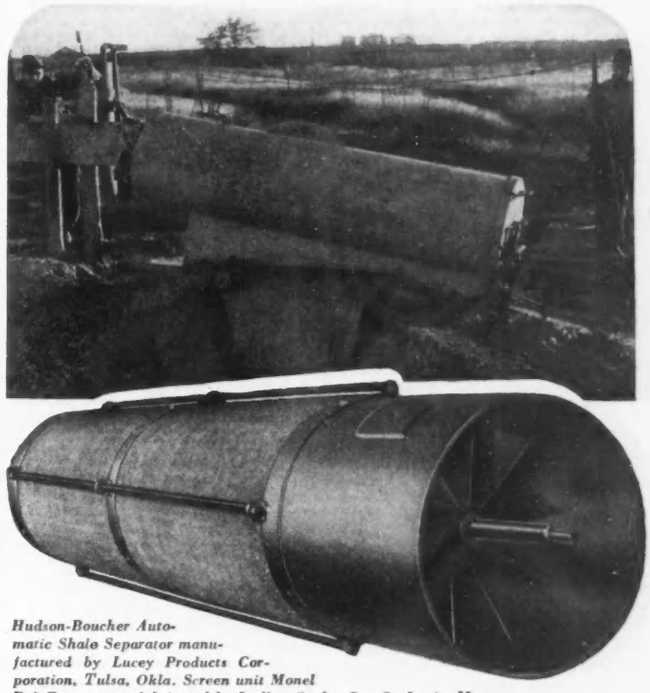
HENDERSON COUNTY

FLAG LAKE

Nine miles southwest Mabank. **Discovery Well:** Sherman Hunt, DeArman & McMillan's A. R. Dillard 1, 1765 ft S and 330 ft W of most northerly NEc of Henry Jeffrey Survey, Nov. 16, 1937, 128 bbls through 3/16-inch choke. **Means of Discovery:** Subsurface geology and geophysics induced the drilling of deep test, which was plugged back to passed-up sand. **Type Structure:** Fault. **Producing Formation:** Woodbine sand, topped at 3093 ft, gun-perforated at 3095-3105 ft, plugged back from 6518 ft. **Producing Area:** Production confined to offsets. **Extent of Development:** Previously drilled Woodbine failures forecast extremely narrow producing zone extending parallel with Mexia-Talco fault plane. **Deepest Test:** Discovery well launched as lower Trinity project on pronounced faulted structure outlined by previously drilled Woodbine failures. No oil or gas shows in deeper zones and quit in Travis Peak, topped at 6429 ft. **Estimated Ultimate Recovery:** 750,000 bbls. **Production Through 1937:** 3600 bbls. **Indicated Remaining Reserve:** 746,400 bbls. **Daily Production March 1, 1938:** 200 bbls; 2 wells. **Gravity:** 44-45. **Oil Outlet:** Trucks. **Ribs Running March 1, 1938:** 1. **Principal Leaseholders:** Hunt, DeArman & McMillan, Harry Hines & J. D. Hancock, Shell Petroleum Corp., The Texas Co., Fred Haynes et al, Humble Oil & Refining Co., and Sun Oil Co. **Remarks:** Performance of discovery well and south offset, completed Feb., 1938, forecast profitable operations if reasonable well spacing plan followed. Comparatively thin oil zone prevails.

OPELIKA (Oil)

One and one-half miles northwest of Opelika. **Discovery Well:** Tide Water Associated Oil Co., Seaboard Oil Corp. and Humble Oil & Refining Co.'s McElreath-Suggett 1-C 1140 ft from S and 990 ft from W lines 149-acre lease, W. P. Wyche Survey, May 7, 1937, 7 bbls oil daily through partially junked hole. **Means of Discovery:** Subsurface geology derived from nearby Woodbine failures and geophysics. **Type Structure:** Dome. **Producing Formation:** Stray lime zone at 7185-95 ft between first anhydrite stringer and massive anhydrite. Only well in district to produce at this level. **Producing Area:** Not outlined. **Extent of Development:** Second deep test for structure missed the oil zone. **Deepest Test:** Dis-



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covery group's McElreath-Suggett 2-C, listed as gas-distillate discovery in deeper zone. **Production Through 1937:** 3250 bbls. **Daily Production March 1, 1938:** 5 bbls. **Gravity:** 37-38 degrees. **Oil Outlet:** Trucks. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Discovery group, Pure Oil Co., Gulf Oil Corp., Continental Oil Co., Sinclair Prairie Oil Co. **Remarks:** Opelika's discovery oil well entered stray pay unexpectedly and excessive pressure forced owners to cement drill pipe in hole when "frozen" about 35 ft off bottom. Considerable difficulty experienced in preventing blowout, with open hole below 1772 ft. Well continues to make occasional oil heads, although manufactured weighting material partially closed openings in rock bit on drill stem.

OPELIKA (Gas-Distillate)

One and one-half miles northwest Opelika. **Discovery Well:** Tide water Associated Oil Co., Seaboard Oil Corp. and Humble Oil & Refining Co.'s McElreath-Suggett 2-C, 880 ft SE of Opelika discovery oil well in upper Trinity, Nov. 30, 1937, 8,000,000 ft sweet gas and 300 bbls distillate daily on ¾-inch choke. **Means of Discovery:** Follow-up development. **Type Structure:** Dome. **Producing Formation:** Lower Glen Rose through gun-perforated casing at 7910-50 ft after plugging back to 8038 ft from Travis Peak series at 9073-9320 ft. **Producing Area:** Not determined. **Production Through 1937:** Production test deferred until January, 1938. **Daily Production March 1, 1938:** Well shut in. **Gravity:** 56-58 (distillate). **Oil Outlet:** None. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** See Opelika's oil listing. **Remarks:** Discovery group unitizing short term leases for purpose of continuing development in search of oil production. This deep gas-distillate well, 880 ft southeast of partially junked oil well in stray lime at 7185-95 ft, failed to produce in the latter zone, but uncovered a prolific gas-distillate pay in lower Glen Rose. Produced about 10,000 bbls distillate while making 30-day production test January, 1938, then shut in for lack of market for gas. Well shows 3200 pounds closed-in pressure.

HOPKINS COUNTY

SULPHUR BLUFF

Two and one-half miles south of Sulphur Bluff. **Discovery Well:** D. S. Hager, W. P. Luse & Russ Pet. Co.'s (Southwood Oil Co., Inc.) J. E. Worsham 1-a, 852 ft from E and 600 ft from N lines of 190¼-acre tract, A. O. Wetmore Survey, July 11, 1936. **Means of Discovery:** Subsurface geology derived from previous Woodbine failures. **Type Structure:** Faulted. **Producing Formation:** Paluxy sand at 4467-4500 ft, pumped and flowed 530 bbls initial. **Producing Area:** 600 acres. **Extent of Development:** Virtually defined and drilled up. **Deepest Test:** L. Goldston-Normandie Oil Corp.'s H. J. Smith 10, J. A. Craft Survey, tested salt water in lower Glen Rose at 6600 ft, plugged back to 4600 ft and completed flowing 32 bbls hourly from Paluxy at 4500-20 ft. **Estimated Ultimate Recovery:** 15,000,000 bbls. **Production Through 1937:** 1,605,107 bbls. **Indicated Remaining Reserve:** 13,394,893 bbls. **Daily Production March 1, 1938:** 3700 bbls; 74 wells prorated to 50 bbls daily each. **Gravity:** 21 to 25 degrees. **Oil Outlet:** American-Liberty Pipe Line Co.'s 8-inch line to Saltillo and 5½-inch line to Talco. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Southwood Oil Co., W. P. Luse & Dilworth S. Hager, W. L. Goldston-Normandie Oil Corp., F. D. Jones et al, Cities Service Oil Co., Shell Petroleum Corp., The Texas Co., and Sun Oil Co. **Remarks:** Efficient well operation and reasonable well spacing prevails. Formation water has been held to a minimum.

HOUSTON COUNTY

GRAPELAND (Oil)

One and one-fourth miles northwest Grapeland. **Discovery Well:** American-Liberty Oil Co. et al's J. A. Bean 2, 540 ft E and 200 ft S of NWc of Wm. Burke Survey, Oct. 4, 1937. **Means of Discovery:** Routine exploration of flanks of gas proved area. **Type Structure:** Dome. **Producing Formation:** Woodbine, topped at 6076 ft, drilled to water at 6087, plugged back to 6075 ft, and gun-perforated 6071-73½ ft, flowed 81 bbls oil and 48 bbls water initial. **Producing Area:** 1-well pool. **Production Through 1937:** 431 bbls. **Daily Production March 1, 1938:** 10 bbls. **Gravity:** 43 degrees. **Oil Outlet:** Tank trucks. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** American-Liberty Oil Co., Cities Service Oil Co., Sun Oil Co., Humble Oil & Refining Co., Gulf Oil Corp., Shell Petroleum Corp., Sunray Oil Co., Magnolia Petroleum Co., and Sinclair Prairie Oil Co. **Remarks:** Performance of the discovery oil well does not encourage further development until market is available for gas production available on top of the dome.

GRAPELAND (gas)

1½ miles NW Grapeland. **Discovery Well:** American-Liberty Oil Co et al (was E. A. Ellison-P. L. McBride-Haberle & Thornton's) J. E. Bean 1, center NW 40-acre of Eli Steadman Survey, July 14, 1936, 70,000,000 cu ft with distillate spray. **Means of Discovery:** Geophysical surveys. **Type Structure:** Dome. **Producing Formation:** Woodbine, 6025-6027 ft. **Producing Area:** 3 scattered gassers indicate 2500 productive acres, with one failure on the southwest flank of the dome. **Production Through 1938:** All gas wells shutin after testing, although 198,811,000 cu ft of gas produced in supplying fuel for drilling tests. **Daily Production March 1, 1938:** None. **Gas Outlet:** None. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** American-Liberty Oil Co et al, Sun Oil Co, Cities Service Oil Co, Humble Oil & Refining Co, Gulf Oil Corp, Shell Petroleum Corp, Sunray Oil Co, Magnolia Petroleum Co and Sinclair Prairie Oil Co. **Remarks:** Completed gassers register 2200 pounds closed-in pressure. No market for the gas production, although United Gas System and Lone Star Gas Co have trunk lines nearby. No additional development is anticipated until market for gas is provided.

PROCELLA

Six miles northeast of Grapeland. **Discovery Well:** Placid Oil Company et al's J. E. Elliott-Shell 1, 561 ft from S & 330 ft from E lines of 200-acre lease, J. M. Procella-P. Evans Survey, May 10, 1937, 77 bbls, 22/64-inch choke. **Means of Discovery:** Geophysics. **Type Structure:** Dome. **Producing Formation:** Woodbine, topped at 5868 ft, drilled to 6634 ft, plugged back and gun-perforated 5868-70 ft. **Producing Area:** 1-well pool. **Extent of Development:** No additional development in immediate area. **Production Through 1937:** 11,662 bbls. **Daily Production March 1, 1938:** None. **Gravity:** 50-52 degrees. **Oil Outlet:** Trucks. **Rigs Running March 1, 1938:** 1. **Principal Leaseholders:** Placid Oil Co., Shell Petroleum Corp., Peyton Bros., Rowan & Nichols Oil Co., and Humble Oil & Refining Co. **Remarks:** Discovery well quit producing Feb. 3, 1938, and has not been restored to production after reconditioning hole. Additional exploration scheduled for current year. Importance of area as potential oil source can not be weighed until more tests completed.

LIMESTONE COUNTY

CEDAR CREEK

Discovery Well: W. A. Reiter, Will I. Lewis & Moutray Oil Co.'s Mrs. R. P. Ward 1, 150 ft from N & 840 ft from M/E/NE line of 208-acre tract, Pedro Varella survey Aug. 24, 1927, flowed 167 bbls oil and 8,000,000 ft gas initial, sand at 2876-79 ft. **Type Structure:** Secondary fault. **Discovery Means:** Subsurface geology. **Producing Area:** 25 acres. **Extent Developed:** Defined and depleted. **Deepest Test:** No test carried below Woodbine. **Production to June, 1931:** (All wells plugged) 297,945 bbls. **Gravity:** 35-36 degrees. **Principal Leaseholders:** Leases surrendered. **Remarks:** Production reached a peak of 1273 bbls daily. All wells plugged June, 1931. Total of 14 oil wells drilled.

MEXIA

Three miles west of Mexia. **Discovery Well:** A. E. Humphreys et al's L. W. Rogers 1, 740 ft S and 668 ft W of northeast corner of tract, Pedro Varella sur, Nov. 18, 1920, 115 bbls initial from sand 3055-68 ft, total depth 3133 ft. **Means of Discovery:** Surface geology and presence of shallow gas production. **Type Structure:** Fault, with approximate dip of 35 to 50 degrees, and displacement of 200 to 400 ft. **Producing Formation:** Woodbine. **Producing Area:** 3720 acres. **Extent of Development:** Defined, but appreciable number inside locations on large leases never drilled. **Deepest Test:** Pure Oil Co.'s W. B. Kendrick 16-T, offsetting Woodbine production and 1700 ft east of Woodbine fault, tested salt water at intervals in lower Trinity, logged Travis Peak 5656-7676 ft, abandoned Jan. 28, 1938 at 8847 ft or 1171 ft in lower Marine series. **Estimated Ultimate Recovery:** 107,312,900 bbls. **Production Through 1937:** 95,312,900 bbls. **Indicated Remaining Reserve:** 12,000,000 bbls. **Daily Production March 1, 1938:** 1954 bbls, 264 pumpers. **Gravity:** 35-37 degrees. **Oil Outlet:** Sinclair Refining Co. and Humble Pipe Line Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** C. L. Brown, Continental Oil Co., Don S. Foster, J. K. Hughes Oil Co., C. F. Lytle, Harry Moss & Urschel, Olsen Bros., Inc., Owenwood Pool No. 3, Pure Oil Co., Rudco Oil & Gas Co., Tide Water Associated Oil Co., and Traders Oil Co. **Remarks:** Woodbine was not considered a potential oil source in geological circles prior to Mexia. Pipe lines originally refused to handle the oil. Large interests were skeptical and were slow in acquiring lease protection and launching drilling campaigns. This accounts for production peak being deferred until late Feb., 1922, when the daily yield averaged 172,320 bbls for a week.

MEXIA (deep)

2½ miles west by north of Mexia. **Discovery Well:** C. L. Brown et al (was Peyton Bros. et al's) Jake Steubenrauch 1, 870 ft from SE and 1170 ft from NE lines of 246-acre lease, May 28, 1935, 1,000,000 cu ft gas when water column kept pumped down, from lower Glen Rose 5100-5706 ft after plugging back to 5671 ft from water in Travis Peak at 5706-6116 ft. **Subsequent Discoveries:** Woodbine production and junked gasser with spray oil in lower Trinity. **Type Structure:** Fault. **Discovery Means:** Deep drilling in old field. **Producing Area:** 1-well pool. **Extent Developed:** Total of 5 tests in Mexia field carried to lower Glen Rose. **Deepest Test:** (Listed under Mexia Woodbine). **Gas Production to 1938:** Not recorded, as original volume barely sufficient to supply engine fuel for nearby Woodbine pumpers. **Principal Leaseholders:** (Listed under Mexia's Woodbine). **Remarks:** Oil and gas possibilities from lower Trinity at Mexia first indicated when E. L. Smith Oil Co et al's Steubenrauch 1, which blew in as a gasser May 23, 1927, from lower Glen Rose passed up in drilling to 5732 ft. Original owners abandoned operations, and Blake Smith et al attempted to condition hole. June 12, 1927 hole was swabbed down 2500 ft, resulting in flow of 3,000,000 cu ft gas, with spray salt water, then increased to 12,000,000 cu ft daily, with spray oil. Well continued to yield gas for about 3 weeks, and the oil, testing 39-40 degrees, gradually increased to 7 to 10 bbls daily by heads. About mid-August, 1927, salt water apparently shut off by bridge, and oil yield dropped to 5 to 7 bbls daily, with about 100,000 cu ft gas. Smith et al later abandoned operations due to junked condition of the hole. Later deep explorations failed to encounter this heavy gas zone, although Peyton Bros. et al's Steubenrauch 1 showed nominal volume of free oil in lower Glen Rose, which was treated with 1000 gallons of acid as a final effort to score production, but no pressure was applied to the acid load.

KOSSE

One and one-half miles northwest Kosse. **Discovery Well:** A. E. Humphreys et al's Jones 1, 2300 ft from W and 2640 ft from N lines of Reuben Flippen sur, blew in Aug. 18, 1922, rated above 5000 bbls pipe line oil daily. **Type Structure:** Fault. **Discovery**

Means: Surface geology. **Producing Area:** Short lived 1-well pool. **Extent Developed:** More than half dozen tests immediate area proved dry. **Production to 1938:** Discovery produced 27,000 bbls oil and exhausted while owners tried to ascertain source of oil and complete. **Gravity:** 30-32 degrees. **Remarks:** Jones 1 showed half bailer oil per hour from top white lime 3695 ft, dropped 5-3/16-inch casing when lowered; drilled by and blew in from 3750-67 ft, spraying 1000 bbls oil, increased to above 5000 bbls daily rate Aug. 18, 1922. Quit flowing 4 p.m. next day. Bridge dislodged and flowed into tanks 10 a.m. Aug. 24, rated 562 bbls oil first hour. Production declined rapidly late same day, and water appeared. Commercial production never restored, although hole plugged back to 3759 ft, excluding water. Hole full salt water followed 60-qt nitro shot Jan. 24, 1923 at 3728-59 ft. Well plugged May 18, 1923.

NIGGER CREEK

West of Mexia field. **Discovery Well:** Transcontinental Oil Co et al's Rosson 1, 225 ft from N&E lines of 19-acre lease, Blk 1, Pedro Varella Sur, July 8, 1926, 2800 bbls from Woodbine at 2841-45 ft. **Type Structure:** Secondary fault. **Discovery Means:** Subsurface geology. **Producing Area:** 170 acres. **Extent Developed:** Defined and depleted. **Deepest Test:** No tests carried below Woodbine. **Production to July, 1931:** (All wells plugged) 2,986,303 bbls. **Gravity:** 38 degrees. **Principal Leaseholders:** All leases surrendered. **Remarks:** Production reached peak of 15,000 bbls daily. Total of 75 oil wells drilled.

WORTHAM

Discovery Well: Boyd Oil Co.'s N. B. Boyd 1, 650 ft from W and 200 ft from N lines of tract, Sarah McNulty sur, Nov. 22, 1924, 1040 bbls initial from Woodbine at 2977-3025 ft. **Type Structure:** Fault. **Discovery Means:** Trend and subsurface geology. **Producing Area:** 715 acres. **Extent Developed:** Defined and all inside locations drilled. **Deepest Test:** Rio Bravo Oil Co.'s S.P. Right-of-way 1-T, abnd in Upper Glen Rose, 4825 ft. **Estimated Ultimate Recovery:** 22,465,000 bbls. **Production to 1938:** 22,415,000 bbls. **Remaining Reserve:** 50,000 bbls. **Daily Production March 1, 1938:** 85 bbls, 7 pumpers. **Gravity:** 39-40 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** C. L. Brown and Pure Oil Co. **Pipe Lines:** Sinclair Refining Co. **Remarks:** Wortham qualified as a spectacular field. Major drilling campaign was getting underway prior to completion of first well, which was held back while Col. Alfred E. Humphreys, now deceased, and other lease owners unsuccessfully tried to obtain orderly drilling pledges. Field was defined and virtually drilled up the first 12 months. Approximately 16,000,000 bbls oil were produced in 1925, and the output dropped to 2,791,000 bbls the following year. Seven remaining pumpers probably will be depleted within 2 years.

LEON COUNTY

BUFFALO

5 miles southeast Buffalo. **Discovery Well:** Lone Star Gas Co (was Shell Petroleum Corp et al's) Beggs 1, near C of 123¼-acre lease, John Carter Survey, A-185, Dec. 22, 1933, 25,000,000 cu ft daily, with spray distillate, on 1-inch choke from sand, topped at 5723 ft; drilled to Georgetown lime at 6115-6140 ft, plugged back to 5852 ft. **Means of Discovery:** Surface geology. **Type Structure:** Dome. **Producing Formation:** Woodbine sand. **Producing Area:** 2-well pool, but large gas reserve indicated. **Deepest Test:** Shell et al's Phillips 1, E. A. Swayze Survey, original prospect for area and 2¼ miles N by W of above discovery, abnd 6300½ ft. **Production Through 1937:** No market or outlet. **Gas Outlet:** Lone Star Gas Co. **Rigs Running March 1, 1938:** 1. **Principal Leaseholders:** Lone Star Gas Co. **Remarks:** Original owners, operating on unit plan basis, suspended development after completing two gassers and providing the North Buffalo dome also for gas. Efforts were waged for 3 years to attract pipe line connection and market for the gas, then the group elected to sell the properties to Lone Star Gas Co, which built an 18-inch line into the field Feb., 1938.

BUFFALO (north)

5 miles northeast original Buffalo gas discovery. **Discovery Well:** Lone Star Gas Co (was Shell Petroleum Corp et al's) Lee 1, 382-2/3-acre lease, William Cooper Survey, A-374, May 18, 1934, 15,000,000 cu ft gas with spray distillate, on 1-inch choke from sand topped at 5494 ft, td 6040 ft, plugged back to 5657 ft. **Means of Discovery:** Geology and geophysics. **Type Structure:** Dome. **Producing Formation:** Woodbine. **Producing Area:** 1-well pool. **Production Through 1937:** No market or outlet. **Gas Outlet:** Lone Star Gas Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Lone Star Gas Co. **Remarks:** Owner built 18-inch trunk line to area and made first gas withdrawals Feb. 15, 1938.

MARION COUNTY

CADDO

Extreme east line with greater portion of productive area in Caddo Parish, Louisiana, which see.

RODESSA

See also Rodessa, Caddo Parish, La., and Miller County, Arkansas. Northeast central Marion County and including Cass County belt to state line. **Discovery Well:** See Rodessa, Caddo Parish, La. **Subsequent Discoveries:** Holcomb, Thomason et al's Lizzie Hender-

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son 1, R. Bennington Survey, January, 1937, opened what has been termed the Jefferson area. **Type Structure:** Accumulation flanking fault line. **Producing Formation:** Dees and Gloyd of Glen Rose, about 6000 ft, and from the Henderson sand above the Gloyd. Trend play from prior deep strike in Louisiana. **Producing Area:** 9200 acres. **Extent Developed:** The major Rodessa trend is still undergoing active development with exploratory tests proving new acreage. To further complicate picture of the present southwestern end of the field, numerous lateral faults made eventual limits impossible to predict. General opinion is that the field is nearing definition. **Estimated Ultimate Recovery:** (Texas side only) Cass County, 89,750,000 bbls; Marion County, 19,500,000 bbls; total Texas, 109,250,000 bbls. **Production to 1938:** 15,836,000 bbls. **Remaining Reserve:** 93,414,000 bbls. **Daily Production Feb. 1, 1938:** 29,910 bbls from 399 wells. **Gravity:** Distillate and 35 to 42 degrees. **Rigs Running Feb. 1, 1938:** 14. **Principal Leaseholders:** W. D. Ambrose, American Liberty Oil Co, Herman Brown, G. H. Chablee, Bessie De Mayo Gulf Oil Corp, H. L. Hunt, Edmund Key, Jr., W. D. Lacy, W. T. Lacy, Magnolia Petroleum Co, Marr & Hoffman, R. W. Norton, Ohio Oil Co, Phillips Petroleum Co, Showers & Moncrief, Spray Oil Co, Superior Oil Co, The Texas Co, Tide Water Associated Oil Co, M. K. Townes, Union Producing Co, Grady Vaugn, Bay Oil Co, Arkansas Fuel Oil Co, Geo. B. Barham, Fohs Oil Co, Heyser-Heard & B. C. Cleary, Holcomb & Thomason, Mullins & Turner, Mid-Continent Petroleum Corp, Shell Petroleum Corp, The Hunter Co. **Pipe Lines:** Magnolia Pipe Line Co, Standard Oil Co of Louisiana. **Remarks:** It is probable that the greatest per-acre ultimate recovery in Rodessa will be from the Gloyd in Marion County, which may exceed 9500 barrels per acre.

NAVARRO COUNTY

CORSICANA-POWELL

Two miles south of Powell. **Discovery Well:** Corsicana Deep Well Co.'s J. H. Burke 1, 155 ft from NE and SE lines of 10-acre lease, W. P. Lane sur, Jan. 7, 1923, 500 bbls from Woodbine at 2960-63 ft. **Means of Discovery:** Geology and deep exploratory work near shallow pools. **Type Structure:** Fault, with approximate dip of 45 to 65 degrees, and displacement of from 400 to 560 ft. **Producing Formation:** Woodbine. **Producing Area:** 2650 acres. **Extent of Development:** Defined and nearly all inside locations drilled. **Deepest Test:** R. L. Wheelock, J. L. Collins, Magnolia and Humble's I. N. Cerf 1, Jas. Smith sur, 1000 ft W of fault, minor oil show 5978-88 ft, abnd Oct. 11, 1934 in Travis Peak 6506 ft. **Estimated Ultimate Recovery:** 135,323,400 bbls. **Production Through 1937:** 125,323,400 bbls. **Indicated Remaining Reserve:** 10,000,000 bbls. **Daily Production March 1, 1938:** 2122 bbls, 168 pumpers including undetermined number wells plugged back to shallow zones. **Gravity:** 37-38 degrees. **Oil Outlet:** Sinclair Refining Co. and Humble Pipe Line Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Roy Albritton, Coffield & Guthrie, Inc., W. J. Collins, Girard Corp., Gulf Oil Corp., G. O. Kent, Moss & Urschel, Natural Petroleum Co., Olson Bros., Pure Oil Co., Tide Water Associated Oil Co., Spandsco Oil & Royalty Co., Stroube & Stroube, and Wheelock & Collins. **Remarks:** Development of flush production in the Woodbine caused an immediate drilling rush. Field attained peak level of 320,182 bbls daily average for week ending Nov. 18, 1923, and 356,000 bbls for a single day. Yearly peak was established in 1924, then dropped sharply. Experience gained previously at Mexia caused lease owners to rush development and take advantage of the flowing life of the field. Figures on Woodbine recovery per acre and well not accurate because of depleted Woodbine wells plugged back to shallow sands then produced into same tank battery as deep wells.

NAVARRO COUNTY

CURRIE

Half-mile east of Currie. **Discovery Well:** Pure Oil Co's (was Humphreys Oil Corp) Meador 1, 1000 ft from S and E lines of lease, M. Boren Sur, Oct., 1921, 300 bbls from Woodbine at 2994-3027 ft. **Subsequent Discoveries:** North Currie extension discovered by Seay-Cranfill et al's West 1-A, which blew in August, 1922, rated at 1000 bbls from top of Woobine at 2987 ft. Exploration of intermediate acreage yielded mostly gas wells. **Type Structure:** Fault. **Discovery Means:** Geology and trend explorations. **Producing Area:** 600 acres (scattered). **Extent Developed:** Defined by an unusually large quota of dry holes. **Estimated Ultimate Recovery:** 4,599,700 bbls. **Production to 1938:** 4,524,700 bbls. **Remaining Reserve:** 75,000 bbls. **Daily Production March 1, 1938:** 122 bbls: 13 pumpers. **Gravity:** 42 degrees. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** American Supply Co, Pure Oil Co, E. L. Smith Oil Co (Lion), and Snowden & McSweeney Co. **Pipe Lines:** Humble Pipe Line Co. **Remarks:** Remaining few wells showing remarkable production stability, with some leases currently producing more oil than 3 and 4 years ago.

RICHLAND

Discovery Well: McDonald Bros. et al's A. N. Brown 1, 427 ft from S and 150 ft from E line lease, John White sur, Dec. 1923, 300 bbls from Woodbine at 2945-2976 ft. **Means of Discovery:** Subsurface and trend. **Type Structure:** Fault. **Producing Formation:** Woodbine. **Producing Area:** 240 acres. **Extent of Development:** Defined and all inside locations drilled. **Deepest Test:** Sun Oil Co.'s H. A. Swink 1-C, Matthew Boren sur, junked May, 1927, in lower Trinity at 5415 ft. **Estimated Ultimate Recovery:** 6,737,200 bbls. **Production Through 1937:** 6,727,200 bbls. **Indicated Remaining Reserve:** 10,000 bbls. **Daily Production March 1, 1938:** 25 bbls, 2 pumpers. **Gravity:** 37-39 degrees. **Oil Outlet:** Humble Pipe Line Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Coffield & Guthrie, Inc. **Remarks:** Situated on a trend between the Currie and Corsicana-Powell fields, the Richland pool was closely drilled. It will likely be depleted during the current year.

PANOLA COUNTY

BETHANY

Northeast sector of county. **Discovery Well:** Gulf Production Co's Taylor 1, Oct. 17, 1917, for light oil and gas production. **Subsequent Discoveries:** Deeper production of minor character proven. **Producing Formations:** Nacatoch sand between 800 and 900 ft, Blossom, 1800 ft, stray sand at 2300 and Adams sand at 2500 ft. **Type Structure:** Dome. **Discovery Means:** Surface geology. **Producing Area:** 21,000 acres proven for gas. **Extent Developed:** Field is developed to maximum in present known productive strata, is rapidly being depleted to supply market. **Deepest Test:** Some gas was proven in Glen Rose at 4700 ft. **Daily Production Feb. 1, 1938:** 9,000,000 cu ft from 104 wells. **Rigs Running Feb. 1, 1938:** 1. **Principal Leaseholders:** Calatex Oil & Gas Co, United Gas Producing Co, Arkansas-Louisiana Gas Co. **Pipe Lines:** Arkansas-Louisiana Gas Co, United Gas Pipe Line Co.

EAST CARTHAGE

Near center of county. **Remarks:** Wildcat gas area producing from four wells, at present without outlet.

TACOMA

North central sector. **Remarks:** Wildcat high proven for some gas; no outlet. One drilling test now idle.

SHELBY COUNTY

HASLAM

Northeast corner county. **Remarks:** Wildcat structure having 3 gas wells, no outlet, no oil.

PICKERING

Northeast sector of county. **Remarks:** Minor, non-active, gas area.

SHELBYVILLE

Southeast of county center. **Remarks:** Minor, non-active, area proven for gas by wildcat test.

TITUS-FRANKLIN COUNTY

TALCO

One and one-half miles east of Talco. **Discovery Well:** W. B. Hinton et al (was C. N. Housh, E. G. Thompson, R. L. Peveto and Hinton's) C. M. Carr 1, SWc of 16.6-acre lease (north), M. V. Delgado sur, Mar. 16, 1936 pumping and flowing 552 bbls from Paluxy at 4190-4208 ft. **Means of Discovery:** Subsurface geology derived from previously drilled Woodbine failures. **Type Structure:** Fault. **Producing Formation:** Paluxy sandy-lime series of upper Trinity, and first commercial production for this zone in Texas. **Producing Area:** 5000 acres. **Extent of Development:** Considered defined, except for possible southwest extensions along fault trend. **Deepest Test:** Ajo Oil Corp. et al's T. J. Sanders 1, center of 4-acre lease, C. Payne Sur, Franklin County, north edge of Paluxy production, showed oil in lower Glen Rose below water, and halted in Travis Peak at 5810-5904 ft. Free oil in lower Glen Rose also found by Magnolia Petroleum Co.'s J. A. Chapman 2, east edge field, but abnd in Travis Peak at 5651-61 ft. **Estimated Ultimate Recovery:** 75,000,000 bbls. **Production Through 1937:** 11,241,900 bbls. **Indicated Remaining Reserve:** 63,758,100 bbls. **Daily Production March 1, 1938:** 31,053 bbls, 605 pumping wells prorated to 50 bbls daily, including 23 marginal wells and 8 dormant wells. **Gravity:** 20-23 degrees. **Oil Outlet:** Humble Pipe Line Co., Talco Pipe Line Co., American-Liberty Pipe Line Co., Constantin Pipe Line Co., and K. & D. Refining Co. **Rigs Running March 1, 1938:** 5. **Principal Leaseholders:** Magnolia Petroleum Co., Humble Oil & Refining Co., W. B. Hinton et al, Housh & Thompson, Inc., Lucey Petroleum Co. et al, Byrd & Frost, Inc., Adams & Lyles, Inc., G. M. W. Oil Co., Tide Water Associated Oil Co., B. G. Byars, Pounds et al, Stroube & Stroube, and 46 smaller operating units. **Remarks:** Taco yielded the first commercial oil production found in the Paluxy sandy-lime section of the upper Trinity in East Texas. Talco's producing area extends along a northeast to southwest trend for a distance of 9.1 miles, with a maximum width of 1¼ miles. The fault plane marks the deadline for production along the north flank. All wells require artificial lifts, and the majority yield a high percentage of water with the oil. Densely drilled areas, particularly the Talco townsite, will not be profitable to well owners. Low price posting and water will hasten abandonment of stripper wells.

VAN ZANDT COUNTY

VAN

Discovery Well: Pure Oil Co.'s W. T. Jarman 1, 150 ft from S and E lines 132.8-acre lease, and Block 2, Nacogdoches C.S.L. sur, Oct. 14, 1929, 1790 bbls from Woodbine at 2684-2710 ft. Deepened to 2947 ft, recompleted Aug. 5, 1930, flowed 481 bbls 24 hours 18/64-inch choke. **Means of Discovery:** Core tests and surface geology. **Type Structure:** Faulted dome. **Producing Formation:** Woodbine. **Producing Area:** 4580 acres. **Extent of Development:** Defined and virtually drilled up. **Deepest Test:** Pure Oil Co.'s V. T. Davis-Unit 1-T, near SEc Section 8, Nacogdoches C.S.L. sur, northwest flank of field, abnd Mar. 4, 1932 in Travis Peak at 6490-7501 ft, with trace gas in Paluxy at 4729-4945 ft. **Estimated Ultimate Recovery:** 325,000,000 bbls. **Production Through 1937:** 111,050,000 bbls. **Indicated Remaining Reserve:** 213,950,000 bbls. **Daily Production March 1, 1938:** 19,155 bbls, 563 wells, including 3 sub-Clarksville marginal wells. **Gravity:** 34-36 degrees. **Oil Outlet:** Pure Transportation Co. and Humble Pipe Line Co. **Rigs Running March 1, 1938:** None. **Principal Leaseholders:** Pure Oil Co., Sun Oil Co., Shell Petroleum Corp., Humble Oil & Refining Co., and The Texas Co., all members of unitized portion of field; Overton Refining Co., Wise & Jackson and J. D. Wrather et al. **Remarks:** Conservation and sound engineering practices have been diligently followed in the development of the Woodbine zone at Van. All prolific wells have been completed through 11/16-inch tubing choke, and none has been subject to open flow. Weighed on a basis of producing area it is the most productive Woodbine strike, having an average Woodbine thickness of 281.6 ft above the water level at minus 2500 ft and a maximum thickness of 650 ft. Bulk of the field is operated by Pure Oil Co. under a perpetual unit agreement shared in by 5 majors beginning Nov. 1, 1929. Production is apportioned between wells on a basis of the productive acre-feet of Woodbine formation and average static bottom hole pressure.

VAN (Shallow)

Situated along north flank of Van Woodbine field. **Discovery Well:** Peden-Olson Oil Co.'s W. S. Brannon 1, 330 ft out of NWc of 45-acre lease, J. Goodman Survey, Mar. 7, 1935, 20 bbls from Nacatoch sand at 1213-28 ft, with hole bottomed at 1240 ft. **Type Structure:** Dome. **Discovery Means:** Previous core tests and Woodbine failures revealed this shallow zone. **Producing Area:** 200 acres (estimated due to isolated wells from main pool). **Extent Developed:** Virtually defined but only partially developed due to small crude yield per well and low recovery per acre. **Deepest Test:** (See Van Woodbine listing.) **Estimated Ultimate Recovery:** 350,000 bbls. **Production to 1938:** 201,372 bbls. **Remaining Reserve:** 148,628 bbls. **Daily Production March 1, 1938:** 136 bbls; 29 pumpers. **Gravity:** 30-32 degrees. **Rigs Running Feb. 1, 1938:** None. **Principal Leaseholders:** Humble Oil & Refining Co., Carter & Jennings, G. R. C. Oil Co., Olsen & Jensen Oil Co., Ammons et al, Alice Holton et al, Tide Water Associated-Seaboard Oil Corp., Jenkins Oil Corp., and A. G. Saleh et al. **Pipe Lines:** Pure Transportation Co. and Humble Pipe Line Co.

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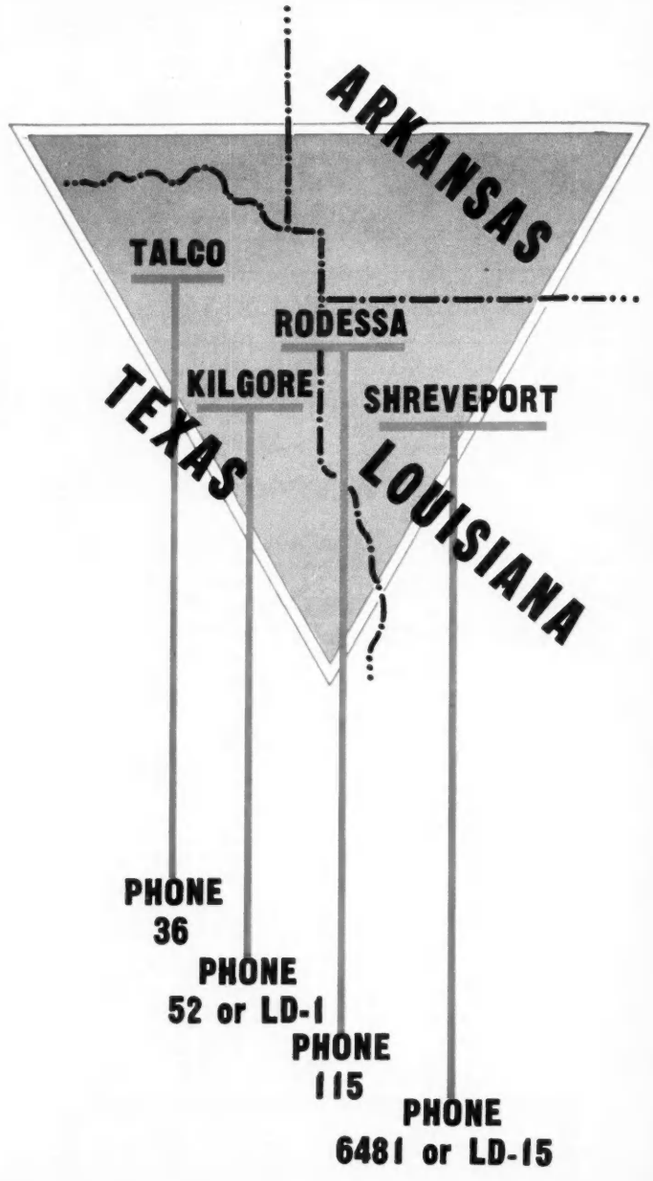
Operators who want to be sure they are getting every cent of value for every dollar they spend,

In the Tri-State area and elsewhere



BRIDGEPORT

The BRIDGEPORT MACHINE COMPANY
Factory and General Offices, Wichita, Kansas

HOUSTON L. D. 203 Local "Cap" 1301

DALLAS L. D. 584 Local 2-4282

SAN ANTONIO L. D. 219 Local "Gar" 5671

CORPUS CHRISTI L. D. 31 Local 574

SHREVEPORT L. D. 15 Local 6481

ODESSA L. D. 683 Local 684

TULSA L. D. 681 Local 5-3204

OKLAHOMA CITY L. D. 785 Local 7-2725

WICHITA L. D. 59 and 116 Local 2-1431 and 2-1432

AND BRANCH STORES

MEN IN THE INDUSTRY'S NEWS

A. C. RUBEL BECOMES MEMBER UNION OIL COMPANY BOARD OF DIRECTORS

V. H. KELLY AND R. E. HAYLETT ALSO ELECTED; BECOME MEMBERS EXECUTIVE BOARD

A. C. RUBEL, director of production for Union Oil Company since 1936, was one of the three department heads added to the board of directors of the corporation at a recent meeting of stockholders at Los Angeles. Others made directors were V. H. Kelly, director of sales, and R. E. Haylett, director of manufacturing. The new directors also were made members of the executive committee, which was increased from six to nine members so as to include the operating heads in all councils.

Rubel, a graduate in mining of the University of Arizona, joined the company as geologist in 1923, was made chief petroleum engineer in 1929, manager of field operations in 1931, and advanced to director of production in 1936, Many advances in drilling and production technique in California are credited to his development work.

Kelly came to headquarters at Los Angeles in 1929, to serve as chairman of the sales committee after 16 years in the Northwest, and has been director of sales since 1931.

Haylett, a graduate of Beloit College and Massachusetts Institute of Technology, joined Union Oil Company as a chemist in 1916. The company's research laboratory at Wilmington was built under his personal supervision and development of the company's propane-solvent refining process for motor oil was under his direction.

A. C. RUBEL

CHESTER R. THOMAS and **O. C. OLSON** left New York on March 15 on the S.S. Excambion for Karachi, India, from which place they will go into southern Iran for geological work with the Amiranian Oil Company. Their post-office address will be 10 Khiaban Nosrat, Teheran, Iran.

SAMUEL F. TURNER, associate hydraulic engineer of the United States Geological Survey, was the principal speaker at the Houston Geological Society's regular weekly luncheon at the Lamar Hotel, March 24. His subject was "Ground Water Work in Texas."

H. J. RUDDLE, associated with Eastman, Dillon & Company, Los Angeles, California, has recently been elected a director for Pacific Western Oil Corporation, Los Angeles.

R. L. KUSS sailed on the S. S. Excambion, March 15 for Beirut, from where he will proceed to Teheran, Iran to work on the first drilling rig sent into Iran by Amiranian Oil Company.

K. L. SIMONS, president of Houston Gas and Fuel Company, and **JOE H. RUSSELL,** vice president of Gulf Oil Corporation, have been named leaders of the annual roundup of the Houston Y. M. C. A. The newly chosen leaders will head a personnel of 200 men in the annual membership drive.

W. G. (BILL) HANRAHAN, pioneer pipe line contractor in the Mid-Continent, has formed his own company at Dallas, located at 5500 Holmes Street. Hanrahan was formerly vice president of the Oklahoma Contracting Corporation. He was also one of the principals in the contracting firm of Jones & Hanrahan at Dallas.

K. THEODORE TAGGERT, George J. Baker, Leslie Baker Richardson, Samuel Ellis McDonald and Charles P. MacDonald, Jr., arrived in Bander Shapur on the Persian Gulf, March 19 with the first supplies for the drilling rig to be used in Iran sent out by Amiranian Oil Company. Their addresses will be 10 Khiaban Nosrat, Teheran, Iran.

ALBERT WRIGHT, general superintendent of Amiranian Oil Company, left New York, March 9 for Iran. His address will be 10 Khiaban Nosrat, Teheran, Iran.

ERNEST O. THOMPSON, member of the Texas Railroad Commission, has only William McCraw, Attorney General as opponent in the forthcoming governor's race. Governor Allred has said he will not seek a third term.

JUDGE RALPH H. SMITH, chairman of Pennsylvania's Oil Industry Investigating Committee, last week announced his candidacy for the Democratic nomination for lieutenant governor. He has teamed up with Thomas Kennedy, present lieutenant governor who is seeking the nomination for governor with the support of C. I. O. forces.

DR. FRANK REEVES and Walter P. Wilson recently returned to Meched from making comprehensive surveys for Amiranian Oil Company in the northern part of the great Iranian deserts. Travel has been both by car and by camel. Much detail work has been done. The party plans to start early in the spring on studies in the favorable areas along the Iranian-Afghan frontier and may continue its work into the vast areas in Afghanistan held under concession by Inland Exploration Company.

M. C. WONG, Calgary, last week was re-elected president of Rosedale Oils, Ltd., organized by the Chinese communities of Calgary and Vancouver, British Columbia, to develop holdings in the vicinity of Grease Creek and southwest of the Duke of Windsor's E. P. Ranch, Alberta. Other officers are Wong Pond, Olds, vice president, and James W. Townshend, D. Austin Lane, Warren Kemp, John Currie and C. Y. George, directors.

REX VIVIAN is manager of the Kabul office of Inland Exploration Company, which holds an oil concession on the entire nation of Afghanistan. E. Gardner Clapp is at present in that office also, having recently returned from the Zahidan office of Amiranian Oil Company in southeastern Iran.

W. H. POLLARD, Turner Valley operator, has subleased the southeast quarter of Section 23, Township 16, Range 3-w5, from Rosedale Oils, Ltd., and is organizing a new Alberta company for its development.

"FISH" ALLEN, drilling contractor, has returned to Flora, Illinois, from a visit to Oklahoma.

KING HOUSTON, associated with International Petroleum Company in the Peru oil fields, making his headquarters at Negrites, Peru, for the past 15 years, has arrived with Mrs. Houston and his small daughter in the Turner Valley field of Alberta, Canada, where he will assume duties as production superintendent for the Royalite Oil Company, Ltd. Houston's first oil field activity was in the Petrolia field of Ontario, the Dominion's first oil field.

FREDERICK G. CLAPP and E. Gardner Clapp, while driving from the oil prospects of Inland Exploration Company in Afghanistan to those of Amiranian Oil Company in southeastern Iran during January, were marooned by floods not far from the railway through Baluchistan. They arrived in Zahidan, temporary

headquarters for many of the Amiranian geologists, early in February. Gardner Clapp will return to the company's office in Kabul. Frederick Clapp will proceed northward through the several sedimentary basins in which the company is operating, inspecting the results of the recent surveys.

PETER G. ALEO of Houston is now in the Long Lake field office of the Houma, Louisiana, district of Fohs Oil Company.

H. A. AFSHAR, until this winter in the geological department of Amiranian Oil Company in Iran, has joined the production department to assist in drilling the first test well now being commenced.

FRANK HUDSON has been advanced to Chief Geologist for Shell Oil Company. He represented Standard Oil Company of New York in China from 1914 to 1916. From 1920 to 1926, he was chief geologist for Ventura Consolidated Oil Company, and since 1927 has been associate geologist and petroleum engineer for Shell Oil Company.

BENNETT FRANK BUIE, with Amiranian Oil Company on its extensive surveys in the favorable northern Iran geological province in 1937, has been transferred to Afghanistan, where he will work in association with Ernest F. Fox for Inland Exploration Company in several promising areas.

SHAPLEIGH G. GRAY, geologist for The Texas Company in the Shreveport district, recently resigned to become connected with Tide Water Associated Oil Company, Houston.

N. M. HUTCHINSON, with Cities Service Oil Company, Bartlesville, Oklahoma, has been elected chairman of the Mid-Continent district of the American Petroleum Institute's division of production for 1938-39.

B. F. TOMBLIN, operator in western Kansas with headquarters at Dodge City, has moved to Wichita and plans to devote his major attention to southeastern and northeastern parts of the state.

HARRY C. HANSZEN, Houston oil operator and chairman of the Houston Community Chest and Council, was recently elected to membership on the national board of chests and councils.

DIED:

CHARLES R. HADLEY, 84, superintendent for Standard Oil Company at Bradford, Pennsylvania, and at Olean, New York, for 30 years prior to his retirement in 1914, died March 11 at West Orange, New Jersey.

FRED T. MILLER, 64, former head of Miller Natural Gas Supply Company, which laid the first natural gas pipe lines in Little Rock 28 years ago, died in the Arkansas city March 16.

Southwest A.P.I.

[*Continued from page 34*]

tenance is an item, Doherty asserted, of particular importance due to the poor quality of the feed water, which usually contains 20 grains per gallon permanent hardness and in some cases 40 grains. Boiler water requirements run from 700 to 800 barrels per day. The problem of water treatment is complicated due to the great differences in character.

Surface formations do not include enough mud making materials, consequently it is necessary to prepare special fluids.

Presence of free gas and fairly high bottom-hole pressures require proper precautions against blowouts.

In drilling surface formations the weight on the bit is varied, as a rule, from 50 to 60 revolutions per minute and the pump is run slow. In the salt and anhydrite sections the weight is gradually increased, and the speed of rotation is 125 revolutions. In drilling the lime the speed of rotation is 100 revolutions.

Paraffin causes considerable production expense, and is generally removed from the tubing by scrapers and from flow lines by heating.

Most oil and gas produced in the Permian Basin contains some sulphur and hydrogen sulfide, and corrosion of surface equipment is prevalent.

Marine Drilling Increasing

With marine drilling operations increasing along the Gulf of Mexico, there was considerable interest in the paper of I. W. Alcorn of The Pure Oil Company, Houston, who described briefly typical drilling locations, which usually consist of marshland, inland lakes and open Gulf waters, and then discussed other phases.

"In considering foundations, the operator must consider not only the cost of installing, but also the cost of cleaning it up." It is highly important to make proper and thorough investigation of all marine locations before deciding on the type of foundation structure.

There is wide difference of opinion, Alcorn stated, as to the desirability of different types of rigs. "Some of the factors entering into such a discussion are: The type of equipment which is on hand; the availability and cost of water and fuel; the cost of providing suitable structures to put the rig on; the projected depths at which the well is to be drilled; and the local marine characteristics of the location."

Operation in marine drilling are, in general, practically the same as those encountered on land, with the possible exception of various safety precautions and devices specified by bodies interested in the protection of fisheries, hatcheries, beaches, etc.

Salt Water Systems

Brine from each well should be analyzed and material for handling them selected with proper resistant properties, in the opinion of J. E. Bailey, Tide Water Associated Oil Company, Kilgore, Texas. "Salt water that is low in parts per million of solids can be handled easily as materials for combatting corrosion have been developed. In handling salt waters that are high in parts per million of solids and readily form precipitate scale, also being corrosive, it is found that most materials make it imperative that the precipitate scale be reduced to a minimum or entirely eliminated before selection of pipe for transporting the salt water."

Well Treatment After Perforating

In discussing well treatment after perforating, Bruce Barkis, Lane Wells Company, Los Angeles, California, stated that while well-cleaning methods now used (mechanical, hydraulic and chemical) yield favorable results, "but little is known regarding the material removed from the well during the cleaning operation, nor regarding the free passage of oil through the area adjacent to pipe perforations at the producing zone."

Detailed records obtained during cleaning operations, not now available, together with conditions before and after perforating would permit a better evaluation of cleaning operations, declared Barkis.

Registrations for the Fort Worth meeting totaled nearly 550, the highest in this history of the Southwestern District of the American Petroleum Institute.

Three resolutions were passed by members and guests of the Southwestern District at the meeting. One of these extended deep appreciation to the Fort Worth committee on arrangements for many courtesies. The committee was headed by Raymond B. Kelly, manager of the Fort Worth division for Pure Oil Company. The other resolutions extended appreciation to the Fort Worth chamber of commerce and to Amon G. Carter for his entertainment Thursday evening at Shady Oaks Lodge.

Morris Named Chairman

W. S. Morris, field chairman of the East Texas Engineering Association, Kilgore, Texas, was elected chairman of the Southwestern District of the American Petroleum Institute's Division of Production at the annual spring meeting in Fort Worth last week.

E. P. Hubbard, Gulf Oil Corporation, Houston, was elected vice chairman for the Gulf Coast Area, K. N. Sappington, Shell Petroleum Corporation, Midland, is the new vice chairman for the West Texas District. C. G. Staley, Lea County proration office, Hobbs, was elected vice chairman for New Mexico; and W. E. Schoeneck, The Ohio Oil Company, Shreveport, was elected vice chairman for Arkansas and North Louisiana.

Gordon Richmond, Hughes Tool

Company, Houston, was elected secretary and treasurer.

Arthur G. Levy, past chairman for the district, became chairman for the advisory committee. Levy is with Crown Central Petroleum Corporation at Houston.

Members of the advisory committee include the following: Edward Freeman, The Texas Company, Houston; E. H. Blum, Atlantic Refining Company, Dallas; A. R. Campbell, Mid-Continent Oil & Gas Association, Shreveport; M. G. Cheney, Anzac Oil Corporation, Coleman, Texas; Sid Childress, Rio Bravo Oil Company, Houston; J. D. Collett, O'Keefe & Collette Corporation, Fort Worth; Jake Hamon, Cox and Hamon, Dallas; Charles Fitzgerald, Sinclair Refining Company (pipe line department), Fort Worth; C. L. Gladden, Magnolia Petroleum Company, Dallas; R. G. Hamaker, Reed Roller Bit Company, Houston; John S. Ivy, Union Producing Company, Houston; J. S. Hasson, The Ohio Oil Company, Shreveport; Casey Cunningham, Standard Oil Company of Texas, Dallas; C. W. Hughes, Arkansas Natural Gas Company, Shreveport; J. C. Johnston, Continental Oil Company, Fort Worth; R. B. Jones, Panhandle Refining Company, Wichita Falls; J. W. Jordan, Sinclair Prairie Oil Company, Midland; E. A. Landreth, Landreth Production Corporation, Fort Worth; A. M. McCorkle, Stanolind Oil & Gas Company, Houston; W. S. Morris (ex-officia member as district section chairman); R. S. McFarland, Seaboard Oil Company, Dallas; J. R. McWilliams, Standard Oil Company of Louisiana, Shreveport; L. M. Moffitt, Triangle Drilling Company, Shreveport; J. A. Ritter, Sun Oil Company, Dallas; C. F. Roeser, Roeser & Pendleton, Incorporated, Fort Worth; Arch H. Rowan, Rowan & Nichols Oil Company, Fort Worth; Joe H. Russell, Gulf Oil Corporation, Houston; E. H. Salrin, Tide Water Associated Oil Company, Houston; John R. Suman, Humble Oil & Refining Company, Houston; C. E. Sutton, Pure Oil Company, Houston; Al Buchanan, Drilling Contractor, San Antonio, Texas; A. J. Galloway, Shell Petroleum Corporation, Houston; and E. Ruebsamen, Trinity Drillers, Incorporated, San Antonio, Texas.

Federal gasoline tax off during February

Collections from the federal gasoline tax in February dropped to the lowest figure for any month since last March, amounting only to $13,541,200, it was announced March 23 by the Bureau of Internal Revenue.

The month's collections were $2,900,000 under the $16,531,890 reported for January and $1,023,000 under the $14,564,131 recorded for February, 1937.

Lubricating oil tax revenues also dropped, amounting to $1,715,439 against $2,211,295 in January and $2,016,705 a year ago, but receipts from the tax on pipe line transportation, at $1,094,979, were $50,000 ahead of January's $1,044,468 and more than $266,000 above last February's $828,161, while revenues from the processing taxes reached the highest figure for several months, $91,065, compared with $74,101 in January and $56,401 in February, 1937.

Association Activities

A.I.M.E. meets with Oklahoma students

The Mid-Continent section, American Institute of Mining and Metallurgical Engineers, with members of the student chapter of Oklahoma University at Norman, as well as the Petroleum Engineers club at the school, held a meeting March 26 in the petroleum engineering building there. The program was in charge of K. A. Covell, assistant manager of southwestern producing division, Pure Oil Company. After a report of the annual convention at New York City, M. L. Haider, Carter Oil Company, spoke on "Applied Petroleum Engineering." A talk on "Seismic Disturbances Induced by Rotary Drilling Rigs," was delivered by Harry F. Wright.

Petroleum industry electrical association meets at Houston

The Petroleum Industry Electrical Association annual meeting at the Rice Hotel, Houston, April 13, 14 and 15, is expected to attract 100 members of the association and probably a larger number of supply company representatives. One of the most ambitious programs yet arranged for the association includes exhibits of manufacturers of equipment for which 38 exhibitors have secured space, showing all kinds of electrical appliances. Invitations have been extended particularly to electrical engineers in the refining industry to extend the interest of the association which has heretofore been largely confined to the pipe line department.

The committee in charge of local arrangements for the meeting includes E. M. Smith, The United Gas Company, chairman; R. M. Bayless, The Humble Pipe Line Company, and J. F. Collerain, Houston Pipe Line Company.

Program outlined for the meeting is as follows:

Tuesday, April 12

8:00 p.m.—Meeting of Board of Directors.

Wednesday, April 13

10:00 a.m.—Address of Welcome: R. M. Bayless, Humble Pipe Line Company.

Response: A. J. Balcom, Magnolia Pipe Line Company, Dallas.

11:00 a.m.—Roll call of members, reading of minutes of 1937 sesson, and report of committees.

1:30 p.m.—Meeting in charge of Safety Chairman R. B. Roaper, Humble Pipe Line Company.

Program by Representatives of Safety Departments of member companies.

Round table discussions.

Rural Electrifications: Open discussion led by J. F. Collerain, Houston Pipe Line Company.

New Equipment and Its Applications: Open discussion led by L. E. Adler, Magnolia Petroleum Company.

Thursday, April 14

9:00 a.m.—"Telegraph Carriers," Hezzie Clark, Humble Pipe Line Company.

"Some Engineering Considerations in the Use of Telephone Repeater and Carrier Systems," J. A. Parrott, American Telephone and Telegraph Company.

1:30 p.m.—"Electrical Protection: Methods, Results and Application," W. B. Poor, United Gas Pipe Line Company.

Election of officers.

7:00 p.m.—Banquet: Main address by W. L. Childs (Reed Roller Bit Company), president, Houston Chamber of Commerce.

Friday, April 15

9:30 a.m.—Installation of officers.

Appointment of new committees and outline business for the coming new year.

Appoint committee for gas appliance meet

Merrill N. Davis of Bradford, Pa., president of the Association of Gas Appliance and Equipment Manufacturers, has announced the appointment of the following program committee for the Association's annual convention to be held at The Greenbrier, White Sulphur Springs, West Virginia, May 25-27:

John A. Fry, president of the Detroit-Michigan Stove Co., Detroit, chairman; W. J. Bailey, president, Day & Night Heater Co., Ltd., Monrovia, California; F. W. Carter, president, Peerless Manufacturing Corp., Louisville, Kentucky; J. F. Donnelly, sales manager, Gas & Electric Heater Co., La Porte, Indiana; L. R. Mendelson, president, Hotstream Heater Co., Cleveland; F. H. Ramage, assistant sales promotion manager, Republic Steel Corp., Cleveland; W. F. Roberts, president, Standard Gas Equipment Corp., Baltimore, Maryland; F. E. Sellman, vice president, Servel, Inc., New York; J. Van Norden, representing the American Meter Co., New York, and H. A. Wilson, president, The H. A. Wilson Co., Newark, New Jersey.

Authorities in the fields of economics, science, commerce and retailing will speak at the convention.

Metals Congress

[*Continued from page 34*]

maximum joint efficiency. It should be tight under the operating conditions, should permit maximum setting depth, should be reliable, economical, safe, and free from side obstruction. Circumferential welding has proved practical and possesses distinct advantage in 10¾ inches, and larger sizes. In smaller sizes welding joints may prove more expensive.

J. C. Hodge, chief metallurgist, and R. Sadler, vice president, Babcock & Wilcox Tube Company, presented an interesting paper on "Weldability and Properties of Materials for Casing Strings." The authors stated that within the past two years

the welding of oil well casings has been introduced as a method of joining in the field individual pipe lengths equal or superior to that of the conventional mechanical coupling. It was shown that the welded joint is by no means generally accepted and a considerable degree of skepticism as to the ultimate success of this relatively new practice exists among oil field operators. A recent survey of oil well casings in the Mid-Continent field shows that only two to three per cent of the surface piping, ranging up to a depth of 1100 feet and only one per cent of the water and oil flow strings, with a depth up to 4500 feet, installed within the past year, has utilized welded joints. It is understood that practically all surface casings in California fields have been welded in the past four years.

It was shown that welding joints on casing strings must be made with the pipe in a vertical position and with only a limited time for making the joint. The welded joints in the condition as welded should develop tensile joint efficiency approaches 100 per cent to withstand the weight of pipe, should possess a circumferential commission held equal of that to the pipe material to prevent collapse failure, and should possess reliable ductility and toughness to withstand normal impact loads involved in lowering the casing.

The four A. P. I. standard grades of pipe, A to D, have increased yield periods and tensile strength. Grades A and B are generally considered as possessing ready weldability. Experiments outlined in the paper indicated that grade C of usual composition may be satisfactory. The usual grade D, an intermediate manganese low alloy steel with reliably high carbon content, may be welded.

"Design and Fabrication of High-Temperature and High-Pressure Piping," a paper by F. C. Fantz, Mid-Western Piping & Supply Company, brought out that the increased use of high pressure and temperatures in the steel plants and oil refineries has forced the designers to look for better means in joining the tubular sections that make up the pipe system. The high cost of flanged joints and the difficulty of maintaining tightness under it has led to the use of welding wherever possible. Flanged joints, if used at all, are used in such places as require dissembling for cleaning or other purposes. Practically all present- day high-temperature piping in control stations, carbon molybdenum steel, allowing a reduction in weight of 40 per cent, it was stated. Oil refineries and industrial piping designs call for high-strength and corrosion resisting alloys. This means a change in welding technique and has made stress relieving on heat treating of the finished assembly necessary.

An interesting paper presented Thursday, March 24, was "Recognizing and Repairing Weaknesses in Existing Pressure Vessels," by K. V. King and F. T. Patton, Standard Oil Company of California. It was stated that every operator of equipment is interested in safety and should periodically take stock of his equipment to insure that no condition that may cause a failure has developed. There are many vessels now in service, even at high pressure and high temperatures, that were built before there was proper appreciation of keeping the working stresses below a safe minimum in all parts of the vessel. The steps in considering many vessels are briefly: First, to determine where the weaknesses may be in the structure; second, to consider the various elements to determine the relative strength of each part; and third, to decide the relative strength of the various parts whether the allowable working pressure should be reduced or whether the weak points can be economically altered or strengthened.

The authors stressed basic preparation rather than construction code requirements, and paid particular attention to the larger weaknesses inherent in seams, heads, and openings. It was shown that if these can be generally appreciated and the unsatisfactory conditions corrected, the operators will be on their way towards realizing a uniform standard for safety in pressure vessels.

The corrosion of steels as affected by welding was discussed in a paper on "Stainless Alloy Welded Plate and Castings—Corrosion-Resisting Pressure Equipment," by Rudolph Simpson. It was shown that for many years preceding the great war metallurgists of at least Germany, England and the United States were working to develop a steel that would aim at counteracting one of the greatest of all evils—the corrosion of steel. The paper discussed at length such phases of operations as welding of castings, welding of plate, choice of welding rods or electrodes. The author stated that the acme of perfection has not been reached in stainless Austenitic steel production. It was further shown that in many cases the cast production was superior to the rolled form, but since corrosion is rather peculiar, the reverse may occur under other circumstances. Resembling a cast structure somewhat perfect welds are often superior in corrosion-resisting qualities to the plates they join, it was stated.

Proration

[*Continued from page 29*]

On March 30 the allocation committee, headed by Aubert, will meet at 10 a. m. in the offices of the Oil Umpire to suggest what the state's fields will produce during April. At 2 o'clock the same day the Central Committee of California Producers is expected to adopt whatever figure the allocation committee proposes, which will undoubtedly adhere to that recommended by the United States Bureau of Mines.

Effective at 7 a.m. last Thursday, General Petroleum Corporation and Union Pacific Railroad Company, operating in the Wilmington field, agreed to cut back their production approximately 13,000 barrels per day.

During the current week, informal discussions were held at the oil umpire's office to further oil curtailment in the Los Angeles Basin, and a big percentage of the townlot producers and operators of large leases are willing to observe the program.

The state yield as of March 19 was set at 729,000 barrels, representing a substantial cut from previous highs recorded due to new completions in the Long Beach section of the Wilmington field.

Texas to continue Sunday shutdown

The Texas Railroad Commission last week issued its April statewide proration order, continuing in effect the allowables which were fixed by the order promulgated for March. The commission likewise extended its Sunday shutdown program for the four Sundays in April.

The effect of this order is to fix a daily average allowable of 1,318,437 barrels. This figure is based on the average for the month, after deducting 5,757,000 barrels, which the commission estimated would be cut from the total monthly allowable by the operation of the Sunday shutdowns.

The total Texas allowable on March 1 was 1,493,173 barrels. It had increased 7,164 barrels to 1,510,337 barrels, which is the allowance fixed by the order of April 1.

The commission made no material changes in the allowances for any field. Additional allowances were ordered for those wells which had been completed during the month, but much of this increase was offset by cuts in allowables to those fields which had been unable to produce the allowable assigned. In the Gulf Coast District, the commission was able to reduce the allowables 4530 barrels, and in Southwest Texas 4500 barrels were cut from allowances made to fields which could not produce all of the oil assigned. No field changes of importance were ordered.

The commission pointed out that of the estimated allowable of 1,318,437 barrels, 56,470 barrels would be exported, leaving 1,261,967 barrels to be absorbed by the domestic market. In a statement issued with the order, the commission pointed out that operators never produce more than 98 percent of the assigned allowable and that this would cut 25,239 barrels from the total allowable assigned.

Thus the commission estimated that the daily production actually entering domestic markets would amount to only 1,236,728 barrels, 93,072 barrels less than the consumer demand for Texas crude during April, as estimated by the United States Bureau of Mines.

The commission in its shutdown order again exempted the Rodessa field, pointing out that it is a tri-state field and that equity requires continuous production.

Compact Commission to meet in Kansas

Wichita.—Tentative date for next meeting of the Interstate Oil Compact Commission has been set for April 29 and 30 to be held at Wichita, E. E. Blincoe, chairman of the Kansas Corporation Commission announced last week. Last meeting of the compact body, held at Oklahoma City, received the suggestion the next meeting be held in Kansas, with members there setting the date.

More Improvement

Spring movement of gasoline to jobbers accelerated in advance of pending freight rate increase and prices trend upward with demand.

FURTHER improvement of the gasoline market within the past week was encouraging, although the advances of the gasoline prices were based not altogether on normal demand but in considerable part on a temporary artificial stimulation of demand by the increased freight rates, scheduled to become effective March 28.

In anticipation of the higher freight rates at that time, large quantities of gasoline have been moving to the consuming centers within the past several weeks. These shipments necessarily have been attended by heavy purchases of gasoline by bulk purchasers and by important jobbers. In fulfilling their exceptional requirements, these purchasers were obliged to bid prices up to higher levels.

Gasoline Prices Up

At the middle of the past week, gasoline prices at Mid-Continent refineries were generally from ⅛ to ¼ cent a gallon higher than one week previously. And these increases were in addition to gains of ⅛ cent a gallon, in some instances, in the previous week.

The abnormal movement of gasoline to consuming centers also was largely responsible for the fact that gasoline storage lately has shown an unusually favorable trend. After having increased steadily and sharply since last fall, the gasoline inventories, in the week ended March 19, showed only a negligible increase.

Crude Market Strengthened

The crude oil markets naturally have been appreciably strengthened by the recent improvement in gasoline prices. And the established crude oil postings consequently appear quite steady at present.

The crude oil markets also have been affected favorably by the indications that crude production control will be exceptionally strict again in April, as in earlier months this year.

In its proration order for April, the Texas Railroad Commission again has called for the closing down of all wells in the state on Sunday. The commission stated that the program for April limits production 11,363 barrels a day under the market demand, as estimated by the United States Bureau of Mines. It stated further that actual production in Texas usually runs about 2 percent below the allowable. The allowable in the various districts of Texas were left virtually unchanged, except for increases resulting from well completions during the past month.

Oklahoma Situation

Oklahoma also is expected to limit production strictly in April. At the state-wide market demand hearing at Oklahoma City, March 31, some of the major crude oil purchasers will request that the allowable production of the state be curtailed to 450,000 barrels a day, a reduction of 25,000 barrels, it had been indicated. In recent weeks, several of the Oklahoma purchasing companies have been buying more crude than they could dispose of in the market.

It is expected also that most of the other important producing states, including Kansas, Louisiana, and New Mexico, will continue in April to exercise strict control of crude production. California continues to have difficulty in limiting production within market demand, but results in April are expected to be about as favorable as in recent months.

East Texas Market Stronger

The crude oil market in the East Texas field, recently shaky, has continued to become more stable because of purchases of surplus crude by major companies. The larger companies lately have been absorbing storage oil in addition to taking over well connections that had been surrendered by independent purchasers.

Because of unfavorable gasoline prices, some of the independent refineries of East Texas in the past few months have reduced their operations or closed down their plants. Consequently, markets were needed for crude in storage at such refineries, as well as

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	83,538,000	96,591,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 29	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 25	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
October 2	3,647,450	3,400,000	309,036,000	65,266,000	117,076,000
October 30	3,602,950	3,345,000	307,140,000	66,836,000	121,070,000
November 27	3,425,800	3,325,000	304,156,000	68,544,000	121,616,000
December 25	3,492,600	3,245,000	303,294,000	74,437,000	118,659,000
January 1, 1938	3,436,600	3,320,000	303,468,000	77,291,000	118,660,000
January 29	3,357,650	3,170,000	304,286,000	84,844,000	118,793,000
February 5	3,316,450	3,155,000	304,494,000	86,484,000	118,619,000
February 12	3,324,500	3,150,000	304,915,000	87,813,000	119,293,000
February 19	3,369,250	3,150,000	305,219,000	89,774,000	119,948,000
February 26	3,322,800	3,170,000	305,167,000	90,719,000	120,958,000
March 5	3,339,700	3,130,000	304,527,000	92,151,000	122,471,000
March 12	3,382,100	3,100,000	305,566,000	93,084,000	122,818,000
March 19, 1938	3,433,550	3,080,000	.....	*93,192,000	122,067,000
March 20, 1937	3,448,150	3,095,000	†290,613,000	81,623,000	97,287,000
Change in past year	—0.4%	—0.5%	+5.1%	+12.9%	+25.5%

* All time peak. † Stocks, March 13, 1937.

for the current production of wells that had been supplying those plants.

Statistics Favorable

There has occurred some additional improvement in the oil industry's statistical position, and current operations are down well in line with the present relatively low levels of demand.

Output of both wells and refineries continues moderate. Crude oil production of the United States, in the week ended March 19, averaged 3,433,550 barrels daily. Although that was more production than in the previous week, it was 4/10 of 1 per cent less than in the comparable period last year.

Refinery operations were curtailed slightly further in the week ended March 19, and crude oil runs to stills averaged only 3,080,000 barrels daily, which was ½ of 1 per cent less than in the corresponding week last year.

The former steady expansion of gasoline stocks was virtually halted in the week ended March 19 as inventories increased only 24,000 barrels in reaching the new all-time peak of 93,192,000 barrels. At that level, the gasoline stocks were 12.9 percent larger than on the comparable date last year. The gasoline stocks still are excessive, however, as consumption is running only slightly higher than a year ago.

Natural Gasoline

Natural gasoline, grade 26-70, was priced generally in the Mid-Continent markets, f.o.b. refineries, at 2½ cents a gallon, and sales were reported at that same price f.o.b. Breckenridge, Texas.

Refinery Prices for Gasoline

U. S. motor gasoline ranged in the Oklahoma market last week about as follows: 62 octane and below 4¼ to 4½ cents a gallon; 63 to 69 octane, 4½ to 4⅝ cents; 67 to 69 octane, 4¾ to 5 cents; and 70 to 72 octane, 5⅛ to 5½ cents.

Corresponding prices in the Chicago market were as follows: 4⅛ to 4¼ cents, 4⅜ to 4⅝ cents, 4¾ to 4⅞ cents, and 4⅞ to 5¼ cents.

In East Texas the most common gasoline, 60-62 400 end-point, was priced generally around 4½ cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4⅛ to 4¼ cents a gallon for the 41-43 water white grade, and from 4¼ to 4½ cents for the 43-44 water white grade. Corresponding prices in the Chicago market were 4⅛ to 4¼ cents and 4¼ to 4½ cents.

Fuel Oils Steady

Fuel oil prices were mostly unchanged. In the Chicago market oil was priced from 4 to 4⅛ cents a gallon. The No. 1 white oil was priced from 3⅞ to 4⅛ cents, and No. 1 straw from 3¾ to 4 cents. No. 2 straw was 3¾ to 3⅞ cents and No. 2 dark from 3½ to 3¾ cents. No. 3 oil was 3½ to 3⅝ cents. No. 4 was $1.05 to $1.10 a barrel to domestic consumers and 95 cents to $1.10 to industrial buyers. No. 5 oils were 70 to 80 cents for domestic and 65 to 80 cents for industrial sales. The No. 6 oil was quoted to the usual industrial customers at 45 to 55 cents a barrel.

CRUDE OIL PRICES

Postings for Pennsylvania grade crudes were reduced 15 to 17 cents a barrel, effective March 7.

All other prices in the United States remained unchanged, as shown in these columns March 7, 1938, pages 72 and 73.

The complete tables of prices are published only in the first issue of each month. The new Pennsylvania grade prices are as follows:

Bradford-Alleghany	$2.05
National Transit Lines	1.98
Southwest Penna. Pipe Line	1.71
Eureka Pipe Line, W. V.	1.65
Buckeye Line, Macksburg, Ohio	1.55

Summary of Wells Completed in the United States Week Ending March 26, 1938

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1938	Total this Date, 1937
Alabama	....	....	....	....	.....	....	1
Arkansas	3	3	....	....	4,008	49	13
California	25	25	....	....	27,090	266	277
Colorado	....	....	....	....	.....	3	5
Florida	....	....	....	....	.....	....	....
Illinois	33	21	1	11	9.033	186	11
Indiana	....	....	....	....	.....	30	33
Kansas	34	26	1	7	37,069	466	495
Kentucky	10	8	....	2	175	165	51
Louisiana	19	15	1	3	8,479	266	161
Michigan	16	10	1	5	2,520	192	194
Mississippi	....	....	....	....	.....	5	5
Montana	5	1	2	2	20	13	17
Nebraska	....	....	....	....	.....	....	....
New Mexico	9	7	....	2	4,731	121	164
New York	....	....	....	....	.....	15	3
Ohio	13	3	5	5	18	240	402
Oklahoma	57	41	4	12	8,271	531	664
Pennsylvania	2	....	2	....	.....	49	35
Tennessee	....	....	....	....	.....	1	....
Texas	258	193	10	55	302,633	3,084	3,199
Utah	....	....	....	....	.....	....	....
West Virginia	8	2	4	2	5	215	206
Wyoming	5	3	2	....	7,874	22	23
Total this week	497	358	33	106	411,926	5,919	5,959
Total last week	422	275	46	101	342,364	....	.....
Total this year	5,919	4,008	552	1,359	4,909,729	....	.....

Comparison of Permits Granted for New Wells

STATE	Week Ending Mar. 26	Total this Mo.	Total this Year	Total this Date Last Year	1937 Year Total
Arkansas	5	17	57	35	240
California	28	111	312	312	1,584
Louisiana	30	80	312	212	1,227
Kansas	25	106	402	513	2,663
Michigan	14	66	156	208	958
Oklahoma	42	139	491	611	2,711
Texas	339	1,182	3,390	4,092	17,238
Total	483	1,701	5,120	5,983	26,621

Production Down

Decrease of 17,079 barrels leaves nation producing 3934 barrels less than Bureau of Mines recommended output.

DUE to a severe cut in California's output, United States crude oil production showed a decrease during the past week, when it averaged 3,387,666 barrels daily. That was 17,079 barrels less than in the previous week and 3934 barrels less than the output suggested by the Bureau of Mines during March.

California's determination to greatly curtail its crude oil production resulted in decreased output in most of the important fields, particularly in the Wilmington area. Likewise Oklahoma succeeded in combating overproduction when it decreased its daily output by about 15,000 barrels. Smaller gains in Texas, Kansas and Louisiana were greatly offset by the substantial declines in the two major producing states.

Still Above Recommendations

California last week encountered a substantial decline of 35,159 barrels daily, which was 30,341 barrels a day more than the Bureau of Mines recommendation and the recommendation of the Central Committee of California Oil Producers. The state averaged 724,940 barrels during the past week.

Oklahoma likewise had a decrease of 14,470 barrels, the production having dropped to 504,825 barrels daily. That was 42,875 barrels less than the Bureau of Mines' estimated demand and 29,825 barrels a day more than the state allowable.

Texas Up Also

Texas output was up 17,950 barrels at 1,304,750 barrels daily, which was 40,150 barrels a day less than the federal allocation and 188,423 barrels less than the allowable prescribed by the state.

Kansas showed a gain of 6700 barrels, having averaged 178,750 barrels daily, which was 2050 barrels more than the Bureau of Mines recommendation and 9222 barrels more than the state allowable.

Louisiana last week averaged 257,425 barrels daily, which was 2050 barrels more than in the previous week, 18,025 barrels more than the estimated demand, and 13,295 barrels a day more than the state allowable.

Mt. Pleasant, Mich.—Michigan crude oil runs averaged 53,477 barrels daily in February as compared to 51,319 barrels in January, according to the Oil and Gas Association of Michigan. Total February output was estimated at 1,497,354 barrels as compared to 1,590,920 barrels in January.

Chapman et al's Edenville discovery well averaged 120 barrels daily, according to the association. Buckeye, Gladwin County, with 372 wells, averaged 26,694 barrels or better than 50 percent of the state's daily output for the month.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Mar.)	State Allowable in March	BARRELS DAILY FOR WEEK ENDED March 26	BARRELS DAILY FOR WEEK ENDED March 19
TEXAS—				
Texas Panhandle	.....	.....	70,100	64,700
North Texas	.....	.....	68,900	66,100
West Central Texas	.....	.....	27,100	26,700
West Texas	.....	.....	185,400	184,200
East Central Texas	.....	.....	97,800	96,300
East Texas Field	.....	.....	428,450	428,100
South Texas	.....	.....	226,700	225,400
Texas Gulf Coast	.....	.....	200,300	195,300
Total Texas	1,344,900	1,493,173	1,304,750	1,286,800
CALIFORNIA—				
Long Beach	.....	.....	58,400	58,500
Santa Fe Springs	.....	.....	39,450	40,300
Huntington Beach	.....	.....	35,600	36,300
Dominguez	.....	.....	29,150	29,500
Inglewood	.....	.....	15,600	17,400
Ventura Avenue	.....	.....	41,200	39,500
Seal Beach	.....	.....	9,320	9,475
Midway-Sunset	.....	.....	69,250	72,300
Elwood	.....	.....	7,690	7,450
Kettleman Hills	.....	.....	82,300	84,200
Mountain View	.....	.....	11,400	12,900
Playa del Rey	.....	.....	6,970	6,950
Wilmington	.....	.....	102,500	118,975
Others	.....	.....	216,110	226,350
Total California	694,600	*694,600	724,940	760,100
OKLAHOMA—				
Oklahoma City	.....	.....	109,450	125,100
Seminole Area	.....	.....	103,950	94,580
Crescent	.....	.....	7,100	7,500
Lucien	.....	.....	13,025	12,750
Fitts	.....	.....	60,750	60,825
Edmond	.....	.....	7,075	6,725
Moore	.....	.....	7,300	7,050
Others	.....	.....	196,175	204,495
Total Oklahoma	547,700	475,000	504,825	519,295
LOUISIANA—				
North Louisiana	.....	.....	77,125	78,175
South Louisiana	.....	.....	180,300	177,200
Total Louisiana	239,400	244,130	257,425	255,375
KANSAS—				
Ritz-Canton	.....	.....	6,475	6,500
Chase	.....	.....	6,125	5,125
Hollow-Nikkel	.....	.....	3,850	3,750
Sedgwick	.....	.....	3,950	3,925
Burrton-Haven	.....	.....	11,525	11,475
Lorraine	.....	.....	2,825	2,775
Russell County	.....	.....	30,450	29,150
Silica—West	.....	.....	15,500	14,850
Silica—South	.....	.....	3,100	2,475
Others	.....	.....	94,950	92,035
Total Kansas	176,700	169,528	178,750	172,050
NEW MEXICO	105,100	105,100	105,000	105,200
MICHIGAN	51,600	.....	52,850	52,700
ARKANSAS	38,200	.....	.....	49,125
MOUNTAIN STATES—				
Wyoming	46,400	.....	50,100	47,900
Montana	13,300	.....	11,850	12,450
Colorado	4,500	.....	4,050	3,850
Total Rocky Mountain States	64,200	.....	66,000	64,100
EASTERN STATES—				
Pennsylvania Grade	.....	.....	81,500	81,000
Southern Illinois (New Pools)	.....	.....	26,700	26,500
Illinois-Indiana (Old Pools)	.....	.....	12,250	12,100
Others, Eastern	.....	.....	20,650	20,400
Total Eastern States	129,200	.....	141,100	140,000
Total United States	3,391,600	.....	3,387,666	3,404,745

* Recommendation of Central Committee of California Oil Producers.

[*Continued from page 32*]

partment of state in Washington, March 22, and the American press has stated that that department, hitherto characterized by a hands-off policy with reference to events in Mexico, has stiffened considerably. Secretary of State Cordell Hull publicly expressed disappointment that expropriation was not accompanied by establishment of a receivership process first. In this connection one unconfirmed rumor is intriguing. From confidential sources came the report that a few hours prior to the expropriation Cardenas finally succeeded in contacting by long distance telephone an official of the Mexican government in Washington, to determine what the state department there would do if he went ahead with the expropriation. It is stated the Mexican official in Washington told Cardenas to go ahead and do whatever he wanted to do—that Washington would do nothing about it. If the rumor of the telephone conversation is true, (and it has not been confirmed) subsequent reactions in the state department would tend to make it appear that the adviser of Cardenas in Washington had erred in judgment, one man averred.

Meanwhile, the Mexican government has taken steps toward settling with the companies the amount of the indemnity and terms of the payment for their properties. Eduardo Suarez, secretary of the Mexican treasury, has invited representatives of the 17 companies to confer with him along these lines. It is doubtful whether the companies can consistently accept this invitation, it is pointed out, as legal counsel of those companies are seeking to establish the unconstitutionality of the action of Cardenas.

Cardenas spoke March 22 to erase fears of general business in Mexico. "No other measures which might affect the confidence of the country will be taken against other business, properties, bank deposits, values and other investments, which the government is ready to protect in accordance with the law." It was pointed out by political opponents of Cardenas that an announcement of the same tenor was made from the offices of the president of Mexico at the time the first great foreign-owned hacienda was expropriated, split up, and turned over to the natives.

Business in Mexico has felt the effect of the expropriation. The Central Bank of Mexico suspended foreign exchange dealings shortly after the decree. Other banks followed suit. Just before the decree the peso was quoted at 3.60 pesos to one American dollar. By March 22 private banks in Mexico were selling United States dollars at the rate of one to 4.25 pesos. Informal transactions at hotels and with merchants are said to have been made at the rate of 6 pesos for a dollar.

Vicente Lombardo Toledano, chief of the Confederation of Mexican Workers, was quoted March 22 as saying the oil industry (under the government) was "working like a clock." And Ramon Beteta, undersecretary for foreign affairs, said the same day, "If the country backs Cardenas we are across the line." Workers in several towns and cities in Mexico staged demonstrations and parades to show that they were behind Cardenas in what they referred to as the liberation of Mexico from foreign imperialism. Description of the parades brought out that antagonism to foreigners was very pronounced, especially toward Americans.

The government has appointed a seven-man petroleum board, jointly representing the government and labor, to run the newly acquired properties of the oil companies. Heading this board is Vicente Cortez Herrera, undersecretary for communications, a man well known in the United States because of his supervision of construction of the Laredo, Texas-Mexico City highway. Early in the week the board was busying itself with finding a market for the 20,000,000 barrels of crude Mexico has been exporting each year. Hitherto most of this oil has been moved in tankers belonging to companies whose properties have been expropriated. However, about 17 percent of the world's tankers belong to independents, and Mexico, naturally, will have to rely on these for transportation of exports for the remainder of the year at least. What proportion of the 17 percent will choose to do business with Mexico has not been determined, but it is logical that some independent tanker operators who have been doing business with the expropriated companies will prefer to hold their good will and continue to be chartered by them. One hurdle this board must clear is that an independent tanker leaving Mexico with oil the companies still consider legally theirs might become, as things stand today, the subject of admiralty proceedings which would tie up the tanker involved for several days. And a tied up tanker is a very expensive proposition for the tanker owner.

A large part of Mexico's oil export has been going to Great Britain and the United States. As things stand, this means Mexico must line up new customers. The Mexican press during the recent past has strongly condemned Germany's conquest of Austria, a situation not calculated to help the market for Mexican goods in Germany. And the opinion has been expressed that California will continue to do most of the exporting to Japan unless Mexico cuts the price of crude. If she does, attention has been called to the fact that there is no international law against the old squeeze play, which the oil companies may eventually come to feel they are being forced to resort to.

Cardenas has said that it is not right to expect future generations to saddle the financial burden arising from indemnities for expropriated properties and other expenses and sacrifices brought about by the expropriation. This probably means early congressional action on special taxes to take care of the need for financing the oil business.

The following telegram was received at noon Friday from Mexico City:

"The government is determined to compensate the expropriated oil companies without levying taxes or increasing existing imposts but by floating a national redeemable bond issue and from receipts of voluntary cash contributions from the public, announces the finance ministry. Public donations for this purpose already total nearly $100,000, the largest contributors being the senate, some individual solons and employees of the economy ministry which before expropriation had charge of oil affairs. Two Germans, one a woman the other an automobile distributor, made fair donations.

"The finance ministry has embargoed some $70,000 cash on hand in the oil companies' offices to assure payment

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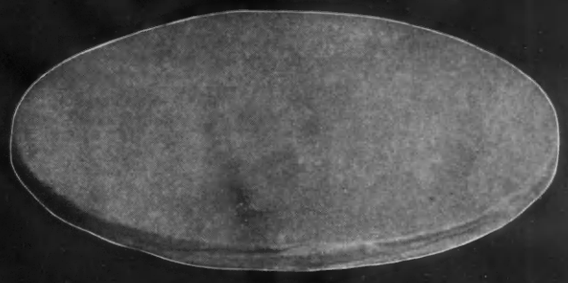
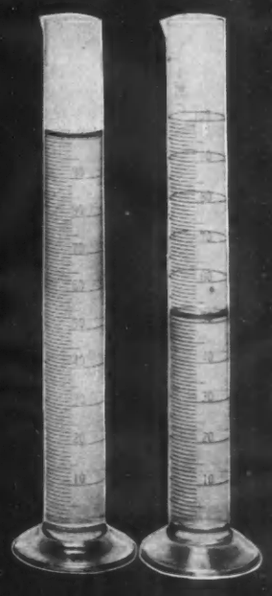
Actual size filter cake (1/8") made from 10.6 lbs. per gal. (80 lbs. per cu. ft.) BAROID-AQUAGEL mud in Wall-Building Tester at 100 lbs. per sq. inch in 3 hours. Water loss, 29 cc. as shown in graduate.



Thin filter cakes are desirable because they minimize the danger of sticking tools when going in or coming out of the hole.

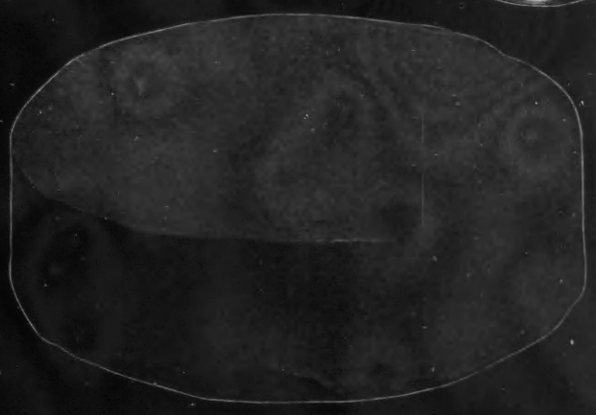
The thickness of filter cakes is also important because it is a direct indication of the over-all quality of the mud — indicating sand content, colloidal content, gel-strength, percentage of solids, and water loss to the formation.

The results of laboratory tests, shown at right, indicate that BAROID-AQUAGEL muds build *thinner, more impervious* filter cakes than other muds of the same weight.



Actual size filter cake (7/8") made from 10.6 lbs. per gal. (80 lbs. per cu. foot) California native mud in Wall-Building Tester at 100 lbs. per sq. inch in 3 hours. Water loss, 151 cc. as shown in graduates.

See Our Exhibit
INTERNATIONAL PETROLEUM EXPOSITION
TULSA
MAY. 14-21



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NATIONAL PIGMENTS & CHEMICAL DIVISION OF
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[Continued from page 30]

of debts it asserts the firms owe the government.

"Oil workers are assured full wage payments to the end of this month at least, as their union announces that the government has sufficient funds to cover these salaries."

Shortly after receiving the foregoing telegram another, from an American oil man, arrived. It read in part as follows:

"Is the good neighbor policy a one-way street and is the United States becoming the laughing stock of Latin America? Are we going to pay Mexico through continuance of the silver purchase program for the privilege of being kicked around the block? If the state department takes this lying down, what will the effect be on the policy toward American interests on the part of other countries which are already nationalization crazy?"

State department worried over Mexican oil affairs

Washington, D. C.—At 5:34 p.m. March 25, it was apparent that expropriation of American and British oil in Mexico properties has raised a number of problems at the State Department here, where officials have consistently refused to discuss the situation.

A major element of uncertainty has been caused by Japanese efforts to negotiate the purchase of the Mexican oil, involved in which would be the construction of a pipe line to carry it to port. Washington authorities are said to look with disfavor upon the making of such an agreement, one of the results of which would be to affect adversely exports from the Pacific Coast, which last year amounted to some 16,000,000 barrels.

In this respect, however, the government here is not without some influence, particularly as the United States has been buying Mexican silver at a good price under an agreement entered into to save Mexico from distress.

British interests are said to look with great disapproval upon the peaceful attitude which has been maintained by the State Department of the United States, and representations have been made through diplomatic channels that the department should oppose the expropriation more strongly. The British position is based on the hands-off demand of this government under the Monroe Doctrine, and English interests are said to resent the maintenance of that policy by the department when it is, they feel, doing little to deal with the situation.

New Mexico Eastern Gas Company has been organized as a subsidiary of Southern Union Gas Company to take over all properties formerly owned by the Consumers Natural Gas Company and its subsidiaries, it was announced in Chicago last week. The action is a step in simplification of the Southern Union corporate structure which is bringing elimination of all sub-holding companies.

offered in evidence from a great mass of papers and the transcript of the hearing of testimony has filled more than 2000 pages from which the examiner will write his report. It seems likely that, although this hearing had been in progress for 16 days and received wide attention throughout the industry, neither side will have gained anything, as numerous statements were contradictory.

Texas secretary of state answers in labor suit

The Secretary of State at Austin this week filed an answer to the application of the Independent Refinery Workers of Nederlands to mandamus Secretary of State Edward Clark, forcing his approval of a charter for the union the workers proposed to organize.

The answer is expected to place issues before the court that will establish precedents when the case is decided. In his answer, Secretary of State Clark set up protests filed by officials for the Committee of Industrial Organization which allege that the proposed union would violate the provisions of the National Labor Relations Act.

One of the principal points for the court to decide is whether the union to be chartered is in fact a company union fostered indirectly by Pure Oil Company. Previously the Labor Board had dissolved the union and instructed the Pure Oil Company to "withdraw all recognition from and to completely disestablish with the refinery workers union."

Clark stated that he believes the application for the new union is for the purpose of controlling laborers under the same domination, that is, under control of the company, and that if the charter had been issued it would have violated the labor act.

Pennsylvania 44-hour law held unconstitutional

Pennsylvania's 44-hour week law for men was declared unconstitutional last week by the Dauphin County Court at Harrisburg. The decision cleared the way for a state supreme court hearing on the law at the court's March session, which opened in Pittsburgh March 21. The law was enacted by the 1937 legislature and was to have become effective December 1, 1937.

Enforcement of the act, termed by industry as the most drastic piece of labor legislation to be enacted by any state and described by promonents as a model receiving consideration by legislators of other states, had been stayed by the lower court for the past month in a suit brought by a Perry County taxpayer who asked that the law be declared inoperative pending decision of legal questions.

"The general 44-hour law, the constitutionality of which is attacked, affects nearly all the male workers of the Commonwealth of Pennsylvania," said Judge W. C. Sheely, who issued the decision. "Enforcement of the act has been suspended by a preliminary injunction. It is important to all parties that the constitutionality of the act be determined promptly. Having concluded that the act is unconstitutional, we are entering an order to that effect at this time in order that an immediate appeal to the supreme court of Pennsylvania may be taken."

Work was restricted to 8 hours a day and 5½ days a week by general provisions of the law. Judge Sheely decreed:

"1. That the act is unconstitutional, illegal and void.

"2. That the defendants (state officials), their successors in office and their and each of their deputies, agents, servants, employes and attorneys be enjoined perpetually from enforcing the provisions of said act against the plaintiffs and from enforcing or attempting to enforce any of the penalties prescribed in said statute for any alleged violation committed by the plaintiffs and from instituting any criminal prosecutions under said statute against the plaintiffs.

In his formal opinion, Judge Sheely held the act an illegal delegation of legislative power and called attention to powers of the state industrial board to issue modifications to strict provisions of the law. "The action of the legislature prescribing a maximum workweek of 44 hours and a maximum work day of 8 hours might be completely nullified or partially or entirely rewritten by regulation of the department. The law, then, would be not what the legislature prescribed but what the department deemed proper."

Attorney General Charles J. Margiotti, prior to the court test of the act, openly expressed "doubt" of its constitutionality.

Complete hearing of Continental controversy

A 15-day hearing conducted by W. C. Holden, National Labor Relations Board trial examiner, on charges preferred against the Continental Oil Company by the Oil Workers International Union was concluded last week at Casper, Wyoming. The union seeks restoration of back pay to employees allegedly dismissed for union activity. The company maintains it had not practiced discrimination against any employee or had in any way interfered with with collective bargaining by its employees in either the Big Muddy or Salt Creek fields or the Glenrock refinery.

Following completion of testimony before Examiner Holden, John P. Akolt, Denver, chief counsel for the Continental company, presented a series of motions that maintained that the evidence failed to establish that the union had any right to ask for certification as the collective bargaining unit for employees; that the production and

gas plant are equally integral departments in operations at the Salt Creek field and no certification of the production department would be proper as it could not be an appropriate bargaining unit, thereby supporting a motion for denial of the union's request in this regard, and that the union failed to show that it is a duly designated representative of a majority of employees at either fields or refinery.

Other motions filed by Akolt asked dismissal of the discrimination cases on the ground that they lacked sufficient evidence to constitute a cause for action, another asked a general dismissal on the ground that the union was without jurisdictional right to file charges, and also that there was a general failure of proof to substantiate the charges. The motions were denied by the examiner.

Besides Akolt, representatives of the Continental company in Casper for the hearing were: John R. Moran, Denver, brother of the company's president, Dan Moran; Walter Miller, Ponca City, first vice president; Joseph Dyer, Ponca City, general production superintendent, and R. S. Shannon, Denver, Rocky Mountain division superintendent.

David C. Shaw, NLRB counsel, presented the union's case.

Louisiana to seek 27-mile sea control

Something new and different has been proposed regarding the disputed title to off-shore lands. Louisiana's attorney general, Gaston Porterie, has revealed plans for submitting to that state's legislature in May a bill to extend the state's boundary 27 miles into the sea. He also plans to submit copies of the bill to other seacoast states for their consideration.

Under the proposal, the states would claim sovereignty 27 miles out from shore, instead of the 3 miles prescribed by international law.

"The 3-mile limit was so recognized as the seaward boundry of each sovereign state," said Porterie, "because 3 marine miles was the distance a cannon could shoot and because a state could make its authority effective only that distance on the sea by the use of artillery located on the shore.

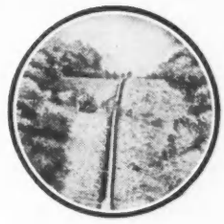
"But in modern times," he continued, "cannons have been improved to such an extent that now many shoot 27 miles and more, and a state now can make its authority effective at least 27 marine miles out to sea, by using artillery located on shore."

This proposal is an outgrowth of the resolution adopted by the United States Senate, and now before the House judiciary committee, calling upon the United States attorney general to institute litigation seeking federal title to submerged coastal oil lands as naval reserves. Louisiana and other sea-bordering states have opposed the resolution, claiming the states have sovereignty to the off-shore lands.

Nevada, Missouri.—Stacey Henderson of Hot Sprirgs, Arkansas, plans a series of immediate core-hole tests prior to drilling one regular test on a block of approximately 20,000 acres he recently leased in township 36 and 37, ranges 25 and 26, Vernon County, west Missouri, 10 miles northwest of Ne-

of Washtenaw Gas Company for per-

PIPE LINE NEWS



Turner Valley line to be ready in May

Work is progressing at good speed on Royalite Oil Company, Ltd.'s addition to its pipe line facilities from the Turner Valley field of Alberta, Canada, to Calgary, refinery and shipping center. The line is being laid on the surface of the ground and will furnish a 6-inch connection to a line formally used as a loop to an existing line at a point 15 miles from the field. The new line is 30 miles long and will be buried this summer. It may be in operation by May 1.

Completion of the project will give the Royalite company, which is a subsidiary of Imperial Oil Company, Ltd., two 4-inch lines of 5000-barrel daily carrying capacity each and a 6-inch line of 14,000-barrel carrying capacity, and is expected to bring an upward revision of 42 perecnt proration now imposed by buying companies because of limited transportation facilities. Several important extensions to markets for Valley crude have been made which, with seasonal increases in demand this spring and summer, is expected to make production and movement of more crude possible. Present carrying capacity of the Royalite company's lines, with the 6-inch loop, is 13,000 barrels daily. No other companies operate lines from the Turner Valley field, although small amounts of crude are moved by truck.

Protest lake dock for Michigan line terminal

Mt. Pleasant, Mich.—A joint program of transporters, refiners and producers to provide a pipe line and lake terminal shipping point for Arenac-Ogemaw produced crudes had met a barrier this week when both resort and fresh water protecting interests filed protests.

Led by United Fuel Oil Corporation of Detroit, the group had planned to construct a 24-mile 4 or 6-inch pipe line from the two fields to a lake shipping point off the west side of the Saginaw bay. The plan is expected to provide cheaper lake transportation of crude and storage facilities during the December-to-April closed navigation season on the Great Lakes.

Michigan Commission blocks use of gas from outside state

The Michigan Public Utilities Commission last week announced a state policy of developing the state's natural gas resources in favor of additional gas from Southwest fields. The commission, in an 80-page order refusing a petition of Washtenaw Gas Company for permission to tap a line from Texas fields running to Detroit, declared that enough natural gas was available in Michigan to supply additional markets, and added that state gas would be cheaper than that imported from Texas because of transportation savings, that property owners would realize more revenue with development of a prosperous state gas industry.

In its first important public stand on the question of state vs. imported natural gas, which has been bitterly argued by independent gas producers and utility companies for many months, the commission said:

"The gas company professed no objection to the use of Michigan gas, but opposed the producers on the factual grounds principally that the reserves of Michigan gas are insufficient to supply any other or further markets than are now being served; that the available supply of Michigan gas is controlled by purchase contracts held by Consumers Power Company and Grand Rapids Gas Light Company, and that by reason thereof no gas is available for the Ann Arbor market.

"These subjects are of vital concern to the State of Michigan, and to the general public of this state, as well as to the producers.

"The natural gas industry is a very considerable industry. The state profits by the severance tax, the amount which depends upon the amount of gas marketed. The people of the communities not receiving natural gas, as well as those who do, have an interest. An increase in the amount of Michigan gas marketed means more purchasing power for Michigan people, while the money paid for Texas gas may go elsewhere.

"Practically all the casinghead gas produced in Michigan goes to waste. Before this type of gas can be distributed in natural gas consuming cities, it has to be treated to extract gasoline and other undesirable elements. In spite of the best efforts of the commission, only one utility has as yet shown any interest in its use [The Gas Corporation of Michigan, serving Mt. Pleasant].

"The production of this gas is equal to approximately 8,000,000,000 cubic feet a year, or just about enough to satisfy the unserved natural gas markets of Central Michigan. As long as the oil production in this state continues to expand, just that long will the production of casinghead gas increase.

"It seems that a sincere desire on the part of gas transmitting and distributing companies would find a way to utilize this commodity and stop this serious waste of valuable fuel. One thing which is clear from the testimony is that the natural gas business from a

marketing and purchasing standpoint is controlled by a single group.

"It is reasonably certain that there are untold quantities of natural gas below the surface of this state, as is evidenced by the many showings of which this commission has record. To permit this huge storehouse of natural fuel to go undeveloped is sheer waste.

"It was shown by the testimony that the cost of transmitting gas from Texas is many times the cost of the gas itself. If Michigan gas is used in Michigan markets in conjunction with sound transmission practice, the cost of the gas at the well would be the major part of the total cost of the delivered gas.

"Should the future develop large supplies, and the price of the gas in the field went down, this reduction should be available at once to the ultimate consumer. With Texas gas, it is obvious that no reduction in the wholesale price of gas can ever be expected, due to the heavy transportation costs which will never go down. An element not to be overlooked is the fact that money spent to produce, develop and purchase Michigan gas stays in Michigan, whereas the money spent to develop, produce and purchase Texas gas leaves the state forever."

Calling attention to a gas well on the McPherson farm in Livingston County where gas was found in Dundee, Monroe, Niagara and Trenton formations, the commission added: "The reason that this well is of great interest is that the famous Glenwood gas pool in southern Ontario produces its gas from the Niagara limestone, which formation is a long life producer. We note the Trenton limestone produces a prolific volume of natural gas in the vicinity of Bowling Green and Findlay, Ohio, where, though the wells are relatively small in open flow, they have been producing gas since the early 1880's."

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Protest building 100-mile gas line in Idaho

A protest against granting a certificate of public convenience and necessity to the Canyon-Payette Oil Company which seeks permission to lay a natural gas pipe line between Weiser and Boise, Idaho, has been filed by the city of Boise with the state public utilities commission.

Drawn by City Attorney Thornton Wyman and signed by Mayor J. L. Edlefsen, the protest says that the "applicant does not now have developed a sufficient quantity or quality of gas and oil in commercial quantities and qualities, and that there are other companies drilling in the same field for natural gas and oil, and that if applicant is granted a certificate it will greatly retard development of gas and oil resources of the state, and that the application is premature."

The proposed line would be approximately 100 miles long.

To resume hearing on Michigan gas control

The Michigan public utilities commission will resume a hearing to consider changes in rules for a stricter regulation of the state's natural gas industry at Lansing March 29 and 30. The commission last week refused to approve appointment of a committee representing all interests affected to help draft new rules for production, transmission and distribution, as suggested by Howell M. Grant, Mt. Pleasant, representing independent producers, but Commissioner Glenwood C. Fuller indicated the suggestion would be given further consideration after additional testimony was received.

In the hearings conducted last week, Fred L. Kircher, of the Lansing city council, charged that "big interests" have discriminated against the state's natural gas industry and announced he would ask some member of the 1939 legislature to sponsor a bill forbidding the sale in Michigan of gas produced in other states until Michigan wells are disposing of at least 5 percent of their open flow. He maintained the state's gas resources are sufficient to supply Flint, Jackson, Kalamazoo and Battle Creek with fuel in addition to present markets.

Humble Pipe Line Company is constructing 11 miles of 6-inch line, parallel to an 8-inch trunk line, from its Judkins-Penwell field station to the Harper and Foster fields, Ector County, West Texas. The latter have registered substantial production gains in recent months by reason of active drilling, and considerable new work is projected.

Financial Field

Reports covering 1937 operations show good year . . . Phillips reports all-time record sales and profits . . . Richfield makes 35 cents share despite late start.

ANNUAL reports for 1937 have been issued by a considerable number of oil companies, in addition to those previously mentioned in these columns.

Colonial Beacon

Colonial Beacon Oil Company and subsidiaries, controlled by Standard Oil Company of New Jersey, reported for 1937 a net loss of $626,685, after usual deductions, compared with a net loss in 1936 of $2,912,702.

Derby Oil

Derby Oil and Refining Corporation and subsidiary, Derby Oil Company, reported for 1937 net income of $426,823, after usual charges, as compared with $248,874 earned in 1936.

El Paso Natural Gas

El Paso Natural Gas Company and subsidiaries, for the 12 months ended January 1, 1938, reported a net income of $1,942,807, after charges, compared with $1,141,105 in the preceding twelve months.

Phillips Petroleum

Phillips Petroleum Company in 1937 set new all-time records in sales and profits, although the earnings in the fourth quarter were far below the level of the first three quarters. Frank Phillips, president, pointed out, moreover, that earnings for the first quarter of 1938 certainly will be less than in the similar period last year. The unfavorable turn of earnings was attributed to the decline of gasoline prices. In consequence, the company has substantially curtailed operating expenses and capital expenditures. But the management of the company has expressed optimism for the future, in the hope that the various unsatisfactory conditions in the industry at present will be ultimately corrected.

The Phillips company in 1937 spent $32,106,813 on plants and properties, and the company's proven oil reserves were increased during the year. The company also further expanded its facilities for the production of natural gas, natural gasoline, and carbon black, maintaining its position as the largest natural gasoline manufacturer and the largest supplier of gas for the manufacture of carbon black.

The Phillips Petroleum Company and subsidiaries for 1937 reported a net profit of $24,113,874, after usual deductions, which was equivalent to $5.42 a share on the common stock. In the previous year, the company had a net profit of $17,875,489, or $4.22 a share outstanding during the year.

Richfield Oil

Richfield Oil Corporation and subsidiaries from March 13 to December 31, 1937, showed a net profit of $1,406,456, after all charges, equal to 35 cents a share on the 3,986,638 shares of common stock outstanding.

Richfield Oil Corporation commenced business on March 13, 1937, having at that time, through reorganization and merger, acquired the assets and business of Richfield Oil Company of California and Pan-American Petroleum Company, and the operating properties and business of Rio Grande Oil Company. Inasmuch as Richfield and Pan-American, prior to that time, were in receivership, a comparison of earnings for similar preceding periods is not available.

Sales, excluding state and federal gasoline and oil taxes for the period amounted to $33,622,142. Other operating revenue totaled $1,380,350.

Balance sheet as of December 31, 1937, shows total current assets of $34,632,684, of which $18,230,616 was cash. This compares with current liabilities of $4,810,516, a ratio in excess of 7 to 1. Current assets alone, were approximately three times the total indebtedness of the corporation.

During the period under review the corporation made net capital additions totaling $4,366,715, bringing total capital assets as of December 31, last, to $53,616,715.

After deducting royalty interests, net crude oil production for the period was approximately 4,175,000 barrels. At the close of the year, the corporation had 501 oil welis, of which 364 wells were producing, 24 were shut down for repair, and 113 were shut in. Richfield also had a 50 percent interest in 94 additional oil wells. Mineral rights on approximately 25,500 acres of proven and prospective oil lands were owned in fee and roughly 72,000 acres of proven and prospective oil lands were under lease.

During the 9½ months, 25 new producing wells and one dry hole were completed. In addition, reconditioning work was completed on 13 existing wells, one of which failed to produce. At December 31, last, 6 new wells were being drilled and 3 wells were being redrilled in producing areas; and one test well was being drilled in a prospective area.

Richfield is presently operating 3 refineries. A total of approximately 13,600,000 barrels of crude oil were refined during the period covered by the report.

Modern additions are currently being constructed at the Watson refinery. When completed in late 1938 this refinery will have a cracking capacity estimated at 60,000 barrels of crude oil daily. The Vinvale refinery has a crude oil charging capacity of 10,000 barrels daily with modern cracking facilities estimated at 6000 barrels capacity daily. The Hynes refinery has a crude charging capacity of approximately 50,000 barrels daily.

Richfield's pipe line sytem, wholly in California, consists of 267 miles of trunk lines and 266 miles of gathering lines. In the 9½ months ended December 31, last, approximately 27,500,000 barrels of oil were carried through this system.

Gasoline sales totaled approximately 218,500,000 gallons which were sold through the marketing outlets of the corporation and its subsidiary company, Rio Grande Oil, Inc., in the Pacific Coast territory. At December 31, 1937, products of the corporation and subsidiary were marketed through 210 bulk stations and approximately 4180 retail outlets.

Standard of Nebraska

Standard Oil Company of Nebraska has reported for 1937 a net loss of $96,125 after usual deductions. That compared with a net profit of $74,326 in the previous year.

Standard of Ohio

Several factors entered into the fact that Standard Oil Company of Ohio suffered in 1937 a substantial decline in earnings, as compared with those in 1936. The company reported for 1937 a net profit of $3,362,960, or $3.66 a share. That compared with $4,194,314, or $4.76 a share in 1936.

Causes for the decline in earnings of Standard Oil of Ohio included a loss of $431,245 in the Ohio River flood in January, 1937, and the decline in gasoline prices, in the face of higher costs of crude oil.

Standard Oil of Ohio also made an inventory writedown on the heavy fuel oils that it had on hand at the end of the year, because of a weakening of the market for those oils.

The writedown of inventory values was almost as great as the $400,108 decline in net earnings for 1937.

Texas Corporation

The Texas Corporation for 1937 reported net earnings of $54,574,319, after deductions of all charges, compared with $38,260,341 for the previous year. The 1937 earnings were equivalent to $5.02 per share, compared with $4.10 per share, on a smaller number of shares, for the year 1936. Gross operating income for the year amounted to $376,238,307, compared with $337,467,896 the year previous.

Cash and U. S. Treasury bills on December 31, 1937, amounted to $44,432,671, compared with $32,496,409 cash at the close of the previous year. Current assets on December 31, 1937, were $180,509,345 and current liabilities were $53,450,738, compared with $145,876,044 and $52,696,241 respectively at the close of 1936. Net working capital was $127,058,606 compared with $93,179,803 at the end of 1936.

Cash dividends of $2.25 per share, totaling $23,319,723, were paid in 1937, compared with $1.50 per share and $14,000,437 in 1936.

The only funded debt of The Texas Corporation now outstanding is $60,000,000 of 3½ percent debentures due June 15, 1951.

Texas Pacific

Texas Pacific Coal and Oil Company and subsidiaries reported for 1937 over 50 percent more profit than in the pre-

vious year. The net income for 1937 was $983,303, after usual deductions. That compared with profit of $642,330 in 1936 and with $23,640 in 1935.

H. F. Wilcox

The H. F. Wilcox Oil and Gas Company reported for 1937 a large increase in net income, but the gain was accounted for in material part by a change in the policy of charging drilling costs. The company reported for 1937 a net income of $127,283, as compared with $18,579 in 1936.

Effective January 1, 1937, the Wilcox company adopted the policy of capitalizing intangible drilling costs instead of charging them to income. As a result of this change in policy, the net income for the year 1937 was $88,665 greater than it would have been under the previous accounting policy.

Texas Gulf Producing

Texas Gulf Producing Company will be headed the coming year by M. C. McGehee, Jr., of Houston, who has been re-elected president. Other officers recently elected included: Henry M. Brown, of Houston, vice president; W. J. Norton of New York, vice president, and Doyle Smith of Houston, secretary-treasurer.

Directors of the company previously elected by the stockholders include: M. C. McGehee, Jr., J. A. Elkins, Henry M. Brown, Gurdon Wattles, and Doyle Smith.

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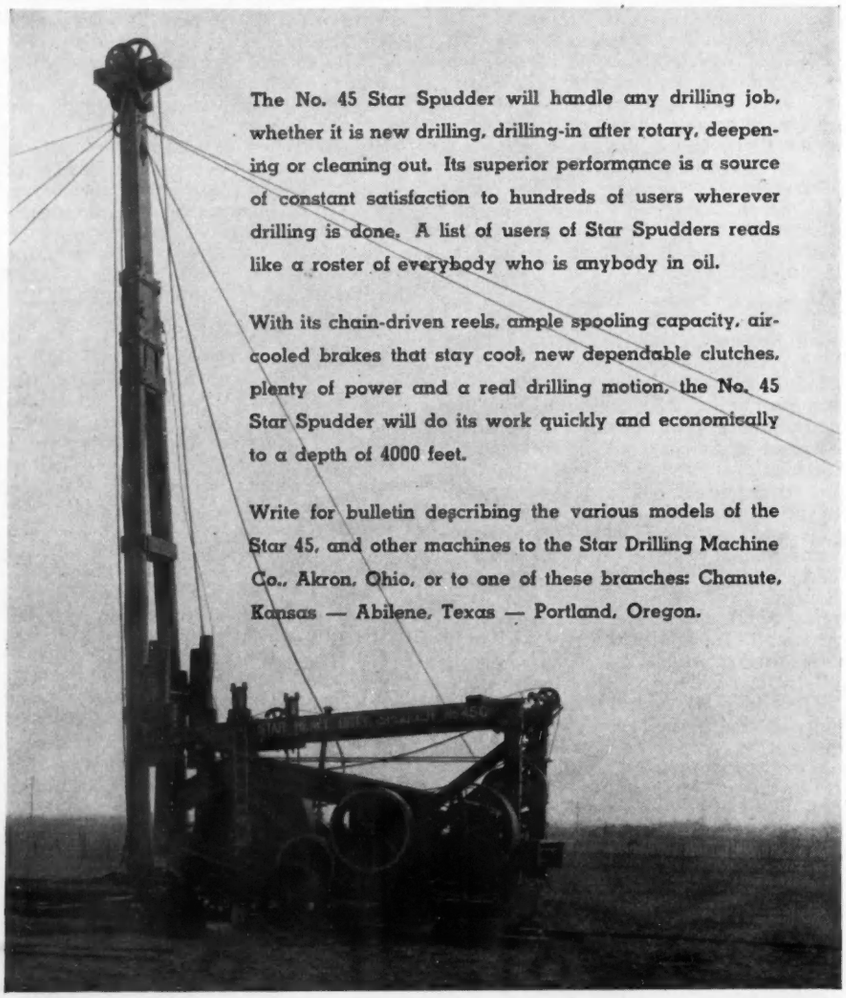

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New California lease law having no immediate effect

Los Angeles.—The oil and gas leasing act, recently adopted by the California legislature, has had no immediate effect upon oil development in Southern California.

Under this act the commission, which consists of lieutenant-governor, controller, and director of finance, is to administer the development of mineral resources of 800,000 acres of state-owned lands. It will negotiate with owners of ocean frontage desiring to drill for oil by whipstocking out under the tide lands.

The act becomes effective 90 days after signature by the governor. The only lands which might be developed within the next few months are tide lands extending north from Twenty-third Street to the city limits of Huntington Beach. Should these lands, which are chiefly Pacific Electric Company holdings, controlled by Standard Oil Company of California and participated in by two other operating companies, develop during summer or fall it is believed that 30 wells would suffice to complete drainage of the Huntington Beach tide lands pool, which already has 80 producers in the townlot area.

Brown vs. Humble finally terminated

The Texas Supreme Court last week refused the application for a writ of error in the case of Brown vs. Humble Oil & Refining Company. This is the case in which the court originally wrote its famous opinion when the case was tried on questions of law, and in that instance found that Brown was not entitled to a well.

The decision last week, however, applied to the trial of the case on its merits and was in that sense a second appeal. In the course of this case, Judge Ralph Yarbrough found in the district court that Brown was entitled to the well. His decision was sustained by the Third Court of Civil Appeals, and the action of the Supreme Court last week finally approved the appellate court decision.

Thus the final result has been that Brown was permitted to operate his well, despite the fact that in its decision on questions of law the Supreme Court suggested that adjustment of allowable, rather than well drilling, should be used to cure drainage inequalities in the East Texas oil field.

Kansas allowable set at 173,000 barrels for April

The Kansas Corporation Commission, meeting at Wichita March 25, set the April crude oil allowable at 173,000 barrels daily, the same figure estimated by the Bureau of Mines as the April demand for the state. It represents an increase of 3500 barrels over the allowable for March, which was 169,528 barrels daily.

ERNEST F. BOND, accountant at the refinery of Cia. Mexicana de Petroleo "El Aguila" S. A. at Minatitlan, Mexico, was married March 18 to Miss Norma Selvidge of Tampico. The bride is the daughter of O. W. Selvidge, secretary to J. W. Bradbury, general agent of Mexican Gulf Oil Company.

OKLAHOMA FIELDS

Hughes County wildcat does 1132 barrels in 5¾ hours.

* * *

Wildcat shows oil in Prue sand in Okfuskee County.

* * *

Waukomis Oil's Garfield County wildcat testing.

Tulsa.—Definitely establishing a new producing area for Oklahoma, Phillips Petroleum Company's Beeker 1, NE NW SW 8-5n-10e, southwest of Calvin in Hughes County last week began its production test, making 1132 barrels of oil in the first 5¾ hours. During the first three hours of the test, the well produced 209 the first, 226 the second and 200 barrels the third hour. Gas, gauged at 2,500,000 feet dropped off to around 1,900,000 cubic feet the third hour. It was making a little basic sediment and some water.

Present producing formation is the Viola lime, topped at 5618 feet. Originally drilled to 6286 feet, the well was plugged back to 5660 feet. It is the second major strike for the state since the opening of the Ramsey pool January 2 of this year. Later reports stated it was shut in for tankage.

Clocking Low

In the Ramsey pool, E. H. Moore, Inc., Boyd 1, NEc 24-18-1e, one-half mile south of the discovery well, was reported checking approximately 70 feet lower than the discovery. Top of the Oswego was found at 4130 feet, 68 feet lower than the formation was found at Ramsey 1. It was preparing to core ahead from 4520 feet.

Considerable attention was being given Stanolind Oil & Gas Company and Amerada Petroleum Corporation's Ridgway 1, NW NE NE 24-3s-9e, southwest of Boggy Depot in Atoka County, which was drilling below 3360 feet. Operators set packer at 3308 feet and took a drill stem test at 3331 feet. When open 2½ hours, the well showed 80 feet of rotary mud cut with a little gas and oil. Later reports stated spotted stains of oil were found in a core from 3331 to 3341 feet.

A new producer for the North Wellston area of Lincoln County is Summitt Drilling Company and Skelly Oil Company's Erwin 1, SE SW SW 35-15n-2e, which flowed 200 barrels of oil in eight hours. It cut about 20 percent acid water the first hour, dropping to 4 percent the last hour.

Burke-Greis Oil Company's Capps 1, SEc 7-13n-7e, may open a new Prue sand pool for Okfuskee County, encountering a show in the formation from 2812 to 2840 feet. It drilled ahead to 3227 feet, but was plugging back for the test.

Ardmore Sector

Oolitic lime was found at Carter Oil Company's Carter-Harley 1, CNW NW 19-2s-3w, in the Carter County portion of the Milroy field last week. Exact top of the formation had not been determined, but a core from 8240 to 8250 feet had a recovery consisting of the lime with a strong odor of gas and some oil. It was coring below 8250 feet.

In the Marlow sector of Stephens County, Coline Oil Company's Johnson 1, SW SE NE 1-2n-8w, developed another bridge after a spray of oil had been reported. It is bottomed at 9086 feet, to which depth it was plugged back after drilling to 10,001 feet several months ago.

Oklahoma City Sector

Tests were being continued at Waukomis Oil Company et al's Clark 1, NWc 34-21n-6w, in Garfield County. It had been making frequent head flows, but later settled to steady flowing production according to reports from the area, where it was stated the well was making 200 barrels of oil every eight hours. Production is from 7280 feet in the Morrison horizon, between the first and second Wilcox sands.

A new wildcat for Logan County is Sinclair Prairie Oil Company's Crews 1, SWc NE 27-16n-1e, which will be drilled to the Wilcox sand. Operators were digging cellar and pits.

Index to Field Development News

Area	Page
Arkansas	202
California	207
Eastern States	210
Illinois	209
Kansas	188
Louisiana Coast	200
North Louisiana	202
Michigan	211
New Mexico	206
Oklahoma	187
Rocky Mountain States	204
East Texas	194
Texas Gulf Coast	198
North Texas	191
Panhandle Texas	193
Southwest Texas	195
West Texas	193

Oklahoma City.—Sinclair Prairie Oil Company will have charge of the salt water disposal plan for the Moore pool, Cleveland County, which was temporarily approved here last week. Approval was announced by R. L. Hodges, head of the pollution division of the state planning and resources board. Work on the project will start at once, with the total cost estimated at $75,000.

Gathering lines from producing leases will run to a dry hole in Section 22-10n-2w. The following areas will be served by the unit: E/2 SW of 16; NE NW, SE, and N/2 SW of 21; S/2 NW, SW, and S/2 NE of 22; NW and SW of 27, and SE and NE of 28-10n-2w.

OKLAHOMA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO COUNTY—		
Ray Stephens, Funk 2, c se sw se 1-5n-9w	295	5354
W. L. Kistler, Hedlund 2, sw ne ne 11-5n-9w	¶161.7	5022
Magnolia Pet., Hedlund 6, sw nw ne 11-5n-9w (owdd)	30	3849
Ohio Oil Co., B. Lacky Acct. 3 2 (Twin) ne se nw 11-5n-9w	10	4500
Ohio Oil, Lackey Acct. 2 (Twin) ne sw nw 11-5n-9w	90	4273
Ray Stephens, Inc., Griffin 3, sw ne se 27-6n-10w	¶35	4377
CARTER COUNTY—		
Geo. Orr et al, Ward 1-A, ep se se se 18-4s-2w	12	1749
Skelly Oil, Miller 3, sw nw ne 5-1s-3w	204	3093
Phillips Pet., Tucker 1, se nw se 5-1s-3w	135	2934
Sun Oil et al, Mullen "A" 16, nw nw se 4-4s-3w (owdd)	24	3058
CREEK COUNTY—		
Comail Oil et al, Coppedge 1, ne ne sw 1-15n-7	*	3904
Patrick Oil, M. Cat 1, se se sw 31-16n-9e (owdd)	*	3090
Pure Oil, Brown 1, ne ne sw 9-17n-7e (owdd)	10	2776
Shaw Doak & Hughes, Anthis 2, ne ne nw 25-17n-7e	15	2504
O. M. Ireland, Bair 4-A, cwp nw sw 11-17n-10e	20	1793
J. M. Scott, Vance 1-A, sw ne ne nw 7-18n-7e	10	2474
F. O. Akin Oil, King 2, se ne sw 35-18n-8e (owdd)	20	2599
Sinclair Prairie, Wallace 2, sw se sw 24-18n-9e	130	3017
L. B. Jackson, Alberta 3, n½ n½ nw¼ 25-18n-9e	45	3078
H. D Daniels, Riley 2, w½ sw ne 24-18n-10e	5	767
Sooner O&G, Collins 1-A, nw nw se se 8-18n-12e (owdd)	*	1995
Geo. Marble, Van Emmons 2, se ne ne 13-19n-7e	15	2497
Big Four Pet., Rector 1, sw nw ne 24-19n-7e	100	2674
BRYAN COUNTY—		
Southern Oil Co., Henry 1, nw nw ne 10-8s-7e	*	5003
LINCOLN COUNTY—		
Mudge Oil, Robertson 1, se ne sw 10-14s-6e	53	3054
Wilcox O&G, De Lozier 2, ne ne nw 15-14n-6e	50	3015
Sac & Fox 9, se nw sw 15-14n-6e	162	3015
MUSKOGEE COUNTY—		
H. H. Heydrick, Bolby 1, cne¼ 22-13n-19e	¶5½	670
NOBLE COUNTY—		
Phillips & Shell, Brumfield 2, sw sw nw 22-23n-2w	960	4284
OKFUSKEE COUNTY—		
Hayes et al, Kennedy 1, sw sw se 21-10n-11e	20	2929
A. W. Swift et al, Adams 1-A, se ne nw sw 14-13n-9e	*	1059

[Continued on next page]

Company, Well and Location	Init. Prod. Bbls.	Depth
OKMULGEE COUNTY—		
C. D. Klingensmith, R. Grayson 18, ne se nw 35-16n-11e	20	2342
Chas. Shock et al, Hawkins 1-B, cw½ nw ne 16-14n-11e	*	2963
OKLAHOMA COUNTY—		
Southwest Pet., Ward 1, ne cor Lot 1, Blk 2, Faireys Add., 35-12n-3w.	*	6428
OSAGE COUNTY—		
J. E. Crosby, Osage 1, sw se ne 6-24n-8e	*	2531
L. J. Vance, Osage 2, sw sw nw 25-26n-8e	12	1784
PAYNE COUNTY—		
Sun Oil, Kolb 2, nw ne sw 5-19n-5e	70	3613
PONTOTOC COUNTY—		
Carter Oil, Lucy Brown 2, ne se se 25-2n-6e (pb and dd)	100	4280
Magnolia, J. Norris 1, se se ne 26-2n-6e, (owpb)	68	4424
Magnolia Pet., F. Young 2, ne ne nw 22-2n-7e (owdd)	199	4331
Magnolia Pet., Augustanna 1, sw sw ne 26-2n-7e	2737	4070
Carter Oil, Hardin 11, nw ne sw 30-2n-7e (owpb)	5	3563
Magnolia, Hardin 9, sw ne sw 20-2n-7e (pb-tw)	209	3805
Lake Oil Co., Grey "B" 1, se nw sw 25-5n-4e	136	2605
POTTAWATOMIE COUNTY—		
Magnolia Banta 6, se ne se 14-7n-4e	385	3138
E. E. Billington 5, 22-7n-4e (owpb)	185	4174
E. W. Jones, McWaters 1, se ne ne 35-7n-4e	250	4117
SEMINOLE COUNTY—		
V. A. Manahan et al, Charnick 2, ne nw sw 4-6n-6e	*	2964
I. T. Troup et al, Snyder 1, nw ne nw 4-6n-6e	930	2882
J. F. Smith, Harryman "A" 2, nw sw sw 33-7n-6e	530	2929
Pure Oil, Reed 13, sw nw se 14-8n-6e	*	4302
STEPHENS COUNTY—		
Skelly Oil, Selby 31, sw nw nw sw 26-1s-5w	8	755
Magnolia, Wilson 1, se se nw ne 34-1s-5w (owdd)	¶90	915
Gulf Oil, Bowers 13, sw sw sw 13-2s-4w	4	628
TILLMAN COUNTY—		
M. G. Martin, J. B. Parris 1, nw nw sw 3-3s-19w	*	3506
TULSA COUNTY—		
W. C. Elliott & Bros., Osage 3, n½ nw se sw 10-21-12e	8	1493

*Failures; †Junked; ¶Million cu. ft. gas.

KANSAS FIELDS

Continental wildcat cores saturation in Siliceous.

* * *

Running casing for test southeast of St. John pool.

* * *

Well extends Silica pool three-quarter miles west.

Wichita.—Three Kansas wildcats were showing as possible pool openers as the past week ended, two of them outpost tests on the western edge of the state. In Stafford County, a new area looked to be on the way, 8 miles southeast of the St. John pool. One pool was extended and two others were watching edge tests.

Continental Oil Company and Cities Service Oil Company's Trexler 1, CE½ W½ NE 15-9s-21w, may open a new producing area for northwestern Kansas after getting a saturated core from Siliceous lime at 3719 feet. The well, located 15 miles southeast of Hill City in Graham County, apparently is on a cross trend between the Webster pool of Rooks County and the Wakeeney pool of Trego County. It was preparing for a test.

Prepares to Test

Atlantic Refining Company's Nunn 1, SEc NE 27-21s-34w, wildcat northwest of Garden City in Finney County, was preparing for a second drill stem test after the first failed to function. Drill pipe stuck in the hole at 4311 feet following the first test. The show was had at 4300 feet in Lansing lime. It is 8 miles southwest of the Shallow Water pool of Scott County.

National Refining Company's Bonham 1, SWc SE 28-25s-12w, 8 miles southeast of the St. John pool in Stafford County, was showing some free oil in Siliceous lime at 4209 feet, indicating it might open another pool for the county. Casing was to be run for a test.

Silica pool of Barton County was extended three-quarters of a mile west last week at Simpson Oil Company et al's Dick 1, NE NW NW 3-20s-11w. It was completed for a potential of 258 barrels of oil from a total depth of 3328 feet in Siliceous lime.

Watch Zenith Outpost

Stanolind Oil & Gas Company's Martin 1, SEc NW 14-24s-11w, may extend production one-half mile north for the Zenith pool of Stafford County. The test had a saturated core in Misener sand at 3802 feet and was running casing preparatory to drilling in. It was reported running 6 feet higher than Stanolind and Amerada's McComb 1, one-half mile to the south, recently completed as the largest producer in the area, making a potential of 2622 barrels of oil.

South extension of the South Trapp pool of Barton County is being watched for at Shell Petroleum Corporation's Margheim 2, NEc NW 12-16s-14w. A show of oil was had at 3320 feet in Siliceous lime in a core. Casing was being run before tests are started. First well drilled on the lease was dry.

Two and one-half miles south of Davidson pool, Barton County, Sinclair Prairie Oil Company's Frederick 1, SWc SE 16-16s-11w, was coring. The test found light shows of oil in Siliceous lime at around 3335 feet.

Casing was being run for a test at Atlantic Refining Company and Simpson Oil Company's Boxberger 1, NE SE NW 10-15s-14w, 1½ miles southwest of the Smoky Hill pool of Russell County. Top of the Kansas City lime was found at 2984 feet. A core

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(see opposite page)
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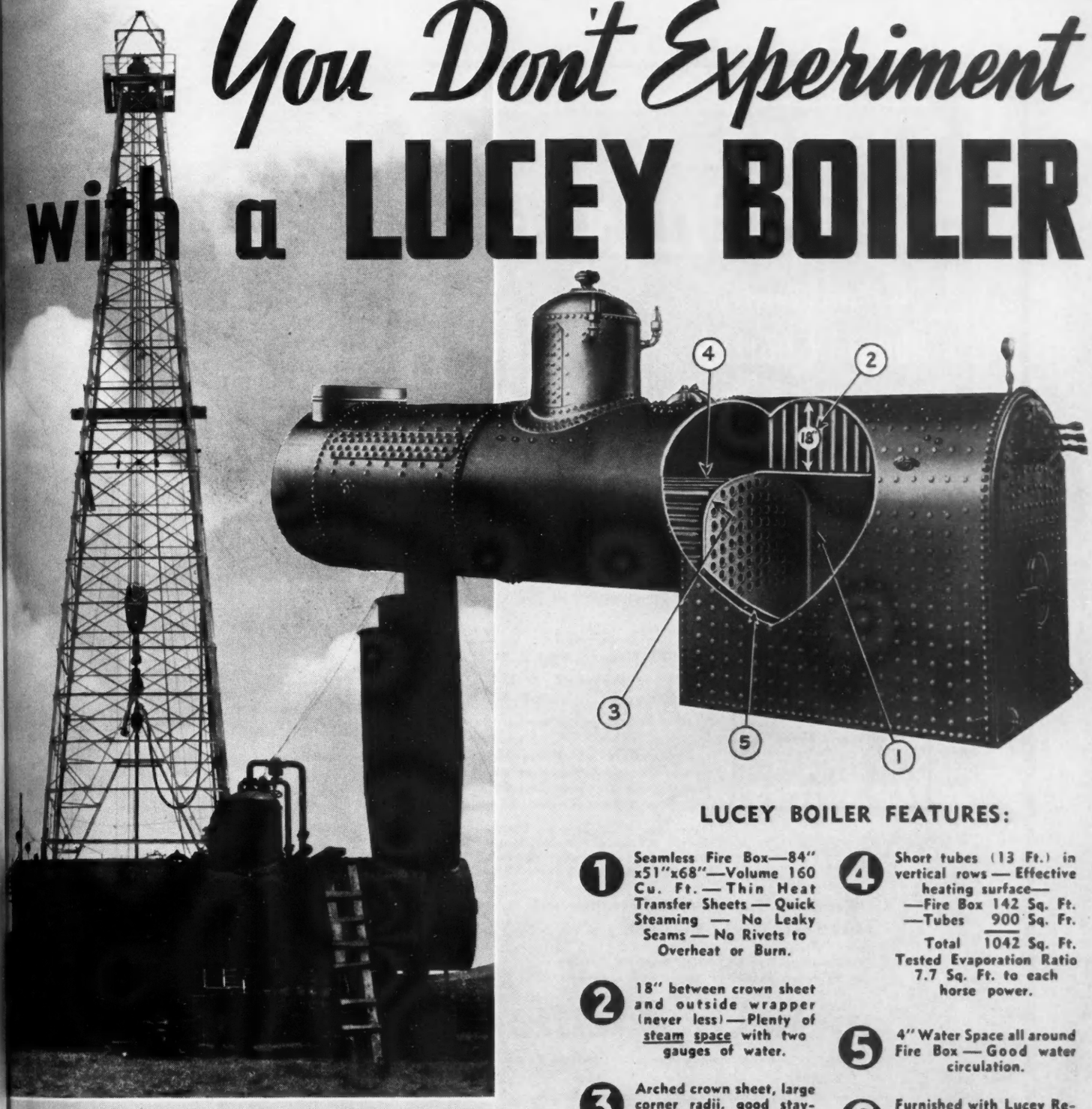

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from the total depth of 2987 feet had oil showings.

Carter Oil Company and Wentz Oil Corporation's Lytle 1, C NE NW 6-32s-14w, southwest of the Lake City pool in Barber County, was drilling below 4938 feet in shale. The well had a small show of oil in the Simpson between 4848 and 4856 feet.

In McPherson County, Carter Oil Company's Nelson 1, CEL NE SE 7-17s-3w, northwest of Lindsborg, was waiting on cement after setting 7-inch casing at 3346 feet. Total depth was 3362 feet.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARTON COUNTY—		
Shell Pet., Burmeister 1, sw nw se 3-17s-11w	2457	3312
Gulf Oil, Stueder 1, nw nw se 10-17s-11w	899	3297
T. C. Johnson, Bitter 6, se se sw 8-16s-13w	1968	3393
BUTLER COUNTY—		
Allbe Oil, Wilson 22, cn½ nw ne 27-25s-5e	35	2633
CLARK COUNTY—		
Olson et al, Watkins 1, c sw nw 23-32s-21w	*	7136
ELLIS COUNTY—		
Sinclair Prairie, M. P. Cress, nw sw sw 18-11s-16w	1614	3426
Kerlyn Oil, Rumsey 5, nw sw sw 23-11s-17w	2839	3382
Phil-Han Oil, Richards 1, sw se nw 5-11s-18w	1756	3378
Carter Oil, A. A. Weisner 1, se se se 11-12s-18w	1539	3622
ELLSWORTH COUNTY—		
Colonial Oil, Hogy 1, nw nw sw 16-16s-10w	1219	3342
Continental et al, W. Ploog "A", cs½ s½ sw¼ 27-17s-8w	1668	3254
GREENWOOD COUNTY—		
Arthur Lyke, Beauchat 7, cw½ w½ se¼ 5-24s-12e	20	1775
McPHERSON COUNTY—		
Continental et al, Hetzke 11, sw se ne 29-21s-1w	481	3338
Continental et al, J. P. Huxman 7, cwl e½ nw 29-21s-1w	452	3291
PRATT COUNTY—		
Cities Ser. & Atlantic, Delaney 1, s½ s½ ne¼ 13-26s-12w	*	4347
RICE COUNTY—		
Sinclair Prairie, Bolton 7, ne sw sw 31-18s-7w	*	3282
Continental Oil et al, Pickerill 2, se sw se 13-18s-8w	2157	3232
Sam Schneider et al, Sterling Coll. 1, se sw se 28-20s-8w	*	3482
Saco Oil et al, Foote 4, se se ne 7-20s-9w	677	3281
McPherson Drlg. Yaple 3, nw se se 10-21s-7w	15	3393
ROOKS COUNTY—		
Duee & Farris, Hancock Life Ins. 1, nw sw sw 21-10s-18w	*	3709
RUSSELL COUNTY—		
Texon, Letsch 5, cel wp sw 26-14s-13w	3240	2850
Magnolia Pet., Rogg 2, sw sw ne 27-14s-13w	1718	2886
R. H. Shields et al, Letsch 5, ne nw se 27-14s-13w	2894	2906
Smoky Hill Oil, Guy Miller 4, nw nw ne 31-14s-13w (owdd)	1830	5142
Gulf Oil, Reinhardt 1, sw sw se 19-14s-14w	360	3238
Cities Service Oil, Ehrlich "B" 1, ne ne nw 30-14s-14w	538	3230
Phillips Pet., D. Brandenburg 1, nw nw ne 30-14s-14w	1325	3240
STAFFORD COUNTY—		
Fred Rust, Krankenberg 1, nw nw nw 20-22s-12w	*	3842
Stanolind O&G, C. W. Hahn 1, ne ne nw 14-22s-13w	452	3763
Fain Drlg. et al, C. D. Hughes 1, se se se 13-23s-12w	*	3802
Stanolind O&G, Bert McComb 1, se ne sw 14-24s-11w	2622	3821
Stanolind et al, U. G. Ferris "B" 2, ne se nw 23-24s-11w	2294	3810
STEVENS COUNTY—		
Kuhn Bros., Carpenter 2, cnw¼ 28-33s-36w	¶18	2810

*Failures; †Junked; ¶Million cu. ft. gas.

WEST TEXAS FIELDS

Strike shallow oil in northwestern Crockett County.

* * *

Gulf well extends Slaughter field to southeast.

San Angelo, Texas.—Shallow oil strike for northwestern Crockett County was recorded last mid-week when L. H. Choate, F. T. Hogan et al's University-Gulf 1, NE SW Section 17, Block 14, averaged one barrel of oil per hour on bailing test from sandy-lime at 1457-1463 feet. Pipe will be cemented to exclude salt water sand logged at 1210-35 feet. This wildcat is along a southeast trend from the McCamey field, and is on acreage farmed out by Gulf Oil Corporation, with the deep rights reserved.

Progress on Magnolia Petroleum Company et al's J. H. McKee 1-A, northern Pecos County Ordovician prospect, has been temporarily halted to pull pipe and replace section that has caused tools to hang at the 2770-foot level. Hole is bottomed at 5444 feet, or 669 feet in the Simpson section. It is to be carried to the Ellenberger. Oil and gas showings found in the upper Simpson by this wildcat caused an active lease and royalty play along a general trend to the north and south late last year. Ordovician test for a large wildcat block in western Pecos County is reported to have been staked by Pure Oil Company on the Caldwell land, C NW T&P Section 47, Block 50, Tsp. 10. The block embraces one of the most pronounced surface structures in West Texas. The southeast portion was tested to the 5000-foot level in 1930.

Slaughter Area Extended

Interest in the north portion of the Permian basin is centered around outposts in Hockley and Yoakum Counties. Productive limits of the Slaughter area, Hockley County, were advnaced 2/3-mile to the southeast when Gulf Oil Corporation's Gordon 1 flowed 124 barrels of pipe line oil natural in 24 hours from broken lime section at 4970-5062 feet. Small amounts of salt water appeared in the top section, and increased to 2 gallons per hour on bailing test after drilling the last 5 feet with tools. The hole is bottomed at 1551 feet subsea. The discovery well of the area tested sulphur water at 1470 feet below sea level, indicating an erratic water level for the large structure. Gulf Oil Corporation's Mallett 1, 1¾ miles southwest of the discovery, tested 10 gallons of oil and 30 gallons of salt water per hour at 5090 feet, or 1538 feet sub-sea, and will be deepened.

Expansion of the Yoakum County sector of the Wasson field to the east appeared promising when Shell Petroleum Corporation's Baumgart 1-D, SWc Section 826, logged top of solid lime at 4460 feet, with an elevation of 3562 feet, being 8 feet lower than a flowing producer situated 2/3-mile to the southwest. Baumgart 1-D was drilling at 4750 feet, with pipe cemented at 4620 feet. Continental Oil Company's Moore 1-45, offsetting production near the county line, flowed 561 barrels initial through open tubing and casing after treating lime at 4975 feet with 4500 gallons of acid. Shell Petroleum Corporation's Robertson 1, 1½ miles east of the southeast edge of this field, abandoned at 5330 feet after registering increase in sulphur water. No oil shows were reported, but the hole was deepened for geological information.

Two-stage acid treatment proved more effective than a heavy nitro shot in developing oil from Gulf Oil Corporation's Dixon 1, Yoakum County wildcat situated about midway between the Bennett field and the Bohago 1-well pool. Coring was under way at 5385 feet after testing 4 barrels of oil and 1/3 barrel of water per hour following 5000-gallon acid treatment at 5371 feet. Minor oil show appeared when hole was bailed to bottom following 400-quart nitro shot at 5271-5371 feet.

Additional drilling is in store for the Seminole pool, Gaines County, as re-

TEXAS PANHANDLE

Completions

Company, Well and Location	Init. Prod. Bbl's.	Depth
CARSON COUNTY—		
Texoma Nat'l Gas Co., W. F. Ramming 1-E	¶17	2745
GRAY COUNTY—		
Christie-Hickman Drl. Co., First Nat'l Bank 2	117	2842
Danciger, Beck-Powell 17	129	2932
Magnolia, Fee 20 (227)	418	2975
Plains Holding Co., A. Chapman 4	383	2725
Shamrock O&G Corp., Saunders-Big Gray 6	380	3105
Stekoil Oil Co., Combs-Worley (Conoco) 1-B	23	3099
Stokley & Savage, C. E. Beigel 1	¶1½	2808
Texas Co., Mayberry 2	332	2821
HUTCHINSON COUNTY—		
Alma Oil Co., Whittenburg 3-D	401	3016
Barnsdall, Lewis 8	740	3009
Mid-States Oil Corp., Whittenburg 9-B	759	2750
Phillips, Whittenburg-Gray 4	328	3270
MOORE COUNTY—		
Shell & Sinclair Prairie, Lindsay 1	¶37.6	3278

*Failures; †Junked; ¶Million cu. ft. gas.

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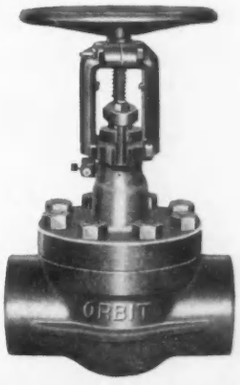

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sult of the completion of Amerada Petroleum Corporation's Robertson 1, one mile east of production, flowing 146 barrels initial on ½-inch choke. Lime at 5104-12 feet was acidized twice. An unsuccessful effort was made to recover tools lost in the hole. It will require 3 offsets.

Development of the Magnolia-Sealy area, twin-pay pool in north Ward County and west of the Gulf-O'Brien field, may lead to the uncovering of an important oil reserve, although first completion was recorded in November, 1930. Magnolia Petroleum Company's Geo. Sealy 2-46, NW SE NE Section 46, Block F, flowed 108 barrels of 33 gravity oil natural in 24 hours from broken lime at 2745-2856 feet, with an elevation of 2717 feet. It is an east offset to Sealy 1-46, which passed up oil show in upper pay, and flowed 125 barrels natural on potential gauge from lime at 3035-40 feet, with an elevation of 2713 feet. Water is found between the two oil zones. Performance of these two wells indicate that most attractive production is to be found to the east of the discovery, and possibly beyond Magnolia Petroleum Company's 24-section solid block. Gulf Oil Corporation holds lease on the acreage to the east.

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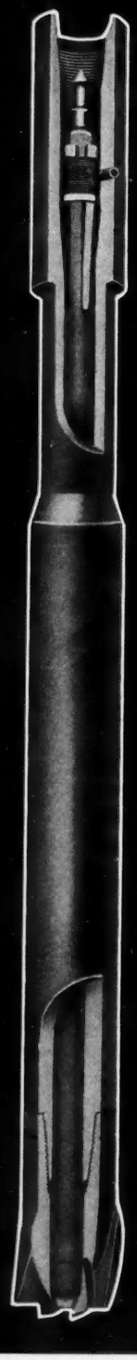

Urge 10-acre spacing for JJJ pool, Jones County

Ten-acre spacing for wells in the JJJ pool, Jones County, was urged at a hearing before the Texas Railroad Commission last week. A well has recently been completed in the area, which is producing from a lime forma-

WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
COCHRAN COUNTY (Duggan)—		
Wiggins et al, Dean 1	332	5077
CRANE COUNTY (Jordan)—		
Atlantic, University 1-A	1854	3557
CRANE COUNTY (McCamey)—		
Continental et al, Cowden 6-B	356	2540
Pitzer & West, Cordova Union 2	434	2144
CRANE COUNTY (Sand Hills)—		
Gulf, Waddell et al 7	3656	6012
Humble, Tubb 17	795	4440
CRANE COUNTY (Waddell)—		
Gulf, Waddell 21	7144	3513
CROCKETT COUNTY (World-Powell)—		
Armer & Black, Powell-Humble 4-B	746	2662
ECTOR COUNTY (Foster)—		
Arrow Drl. Co., York & Harper Foster 1	1093	4260
Barnsdall, Foster 8	540	4230
Broderick & Calvert, H. Foster 7	766	4325
ECTOR COUNTY (Goldsmith)—		
Gulf, Goldsmith 72	44	4195
Goldsmith 79	1580	4200
Phillips-Pure, Cowden 22	2960	4150
Shell, Cummins 4-A	822	4245
T. P. Coal & Oil Co., Scharbauer 17	2310	4250
ECTOR COUNTY (Harper)—		
Barnsdall, Cowden 5	1629	4150
Broderick & Calvert, Parker 4	2980	4182
ECTOR COUNTY (Jordan)—		
Shell, University 1-D	816	3641
FISHER COUNTY (Rotan)—		
Lewis Prod. Co., Morrow 5	422	3572
GAINES COUNTY (Seminole)—		
Amerada, Robertson 1	146	5112
GAINES COUNTY (Wasson)—		
Continental, Moore 1-45	561	4975
HOWARD COUNTY—		
Moore Bros. Corp., Snyder 1-A	626	2845
Schermerhorn-Winton Co., T. P. Land Trust 9	792	2218
R. A. Westbrook-Dick Graham, Great West Ref. Co. 1	*	3857
JONES COUNTY—		
Lewis Prod. Co., H. Sayles 12	*	2000
MENARD COUNTY—		
Clements et al, Murchison 1	*	1320
PECOS COUNTY (Pecos Valley)—		
Aero Gas Ref. Co., Iowa Realty Trust 1	*	1520
Black et al, Iowa Realty Trust 1	*	1800
UPTON COUNTY (Gulf-McElroy)—		
Gulf, McElroy 170	481	3005
UPTON COUNTY (McCamey)—		
Gulf, Rogers 12	601	2250
Humble, Ricker 12-B	426	2695
WARD COUNTY—		
Gulf, Estes 82	1457	2665
Estes 83	530	2940
Hutchings 94	175	2760
Hutchings 98	737	2755
Hutchings 99	1273	2750
Hadlock et al, Jones 1	*	2120
Humble, Richter 32	641	2936
Octagon Oil Co., Buchanan 2	377	2330
Sidwell & Myers, W. E. Cannon-Stanolind 6	*	2353
Superior, Burke-Underwood 1	¶1½	2805
T. P. Coal & Oil Co., M. Barker 14	373	2311
WINKLER COUNTY (Henderson)—		
Humble, Walton 22-C	2500	3040
WINKLER COUNTY (Kermit)—		
Magnolia, Walton 141	1430	2954
Walton 143	1620	2944
Joe C. Maxwell, Inc., Gar-Tex O&G Co. 8	441	3097
WINKLER COUNTY (Keystone)—		
Sharp et al, J. B. Walton-Conoco 2-A	234	3340
YOAKUM COUNTY (Bennett)—		
Mid-Continent, Bennett 2	1916	5236
T. P. Coal & Oil Co., Bennett 6	1558	5275
YOAKUM COUNTY (Wasson)—		
Denver P. & R. Co., Whittenburg 3-A	998	5060

*Failures; †Junked; ¶Million cu. ft. gas.

tion found at 1958 to 1977 feet. This well has been tested at 400 barrels a day, after it was treated with acid.

Estimated recovery from the lime is 3000 barrels per acre, according to testimony presented by F. H. McGuigan, geologist in the area.

The oil produced is 37 to 38 gravity and has been produced with a gas/oil ratio at approximately 1000/1.

Operators proposed that the field be prorated on acreage and per well, with 50 percent assigned on each factor. A maximum acreage allowance of 17½ acres to prevent drilling on fractional units was suggested. Sixty feet of surface casing was recommended to protect fresh water sands.

Heyser spacing

Operators in the Heyser field, Victoria and Calhoun Counties, have requested 20-acre spacing for wells producing from the 6000-foot sand in that field. Only six wells have been drilled to this horizon.

They asked that proration be based on acreage and per well, with 50 percent of the allowable allocated on each factor. The program was approved by Gulf Oil Corporation, Sun Oil Company and other major operators in the field.

339 Texas Permits

The Texas Railroad Commission last week approved permits for drilling 339 new wells in Texas, 29 more than were approved the previous week.

The East Texas field advanced to first place with 80 new locations, including 37 in Gregg, 24 in Rusk, 14 in Upshur, four in Smith and one in Cherokee County. Fourteen locations were reported from the East Central Texas District.

There were 57 permits granted in West Texas, including 26 in Ector and 10 in Ward County, while 19 permits were approved in the West Central Texas area.

Operators in the Gulf Coast District reported 73 locations, including 21 in Harris County. Southwest Texas operators reported 47, including 14 in Duval and 10 in Webb County.

Permits for drilling 29 new wells were approved in the North Texas District, including 18 in Wichita County, while Panhandle operators reported 20 locations.

El Dorado, Ark.—Five drilling permits were authorized last week in Arkansas, all in the Rodessa field, Miller County, or the Schuler field, Union County. The list of permits follows: Miller County—Mrs. S. O. Thompson, T. P. Greer 1, 330 south and 334 east NWc SW NW 11-20-28; Gerhig Company of Arkansas, E. B. Mitchell 1, 336 west and 330 north SEc NW NW 11-20-28; Union County — Edwin M. Jones, Murphy Land Company A-3, 330 south and west NEc SE NE 19-18-17; L. H. Simpson, Kate Powledge 1, 330 north and east SWc S½ NW SW 8-18-17; Phillips Petroleum Company, Marine 3, 990 south and 330 east NWc NW NW 20-18-17.

NORTH TEXAS FIELDS

Development in new Panther district to be conservative.

* * *

Drilling in K-M-A. field continues to gain in volume.

Wichita Falls, Texas.—Development of the new Strawn horizon oil area uncovered in the Panther district, Archer County, will be on a conservative basis for the time being. Close-in acreage is largely held by interests that are occupied with operations in the K-M-A Strawn field. Operating capital and drilling equipment are not adequate to support two boom fields in the district.

The Panther discovery, drilled by L. V. Hull, W. W. Silk and Helmerich & Payne, Inc. on the L. F. Wilson ranch, NWc SE A. T. N. C. L. Section 25, flowed 244 barrels of oil in 3 hours through ¾-inch tubing choke on proration gauge. It is producing from sandy-lime at 3841-58 feet, with an elevation of 1034 feet. Owners have started operations on Wilson 2, 1000 feet southeast of the producer, to fulfill a 5300-foot depth contract in accordance with the terms of the lease assignment. This test will reach the Ellenberger section of the Ordovician, and if this lower zone is non-productive the hole will be plugged back for completion in the Strawn.

Competition for lease protection has been nominal in comparison to the play given the K-M-A field late last year. Buying has centered along a northeast to southwest trend. Top price of $500 per acre cash offers quite a contrast to the bonuses paid for close-in acreage at K-M-A when enthusiasm was at a high pitch. J. A. Chapman and Ed. McFarlin, former officials of McMan Oil & Gas Company, are credited with having paid the $500 per acre cash bonus for 160 acres in the north

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portion of Section 29, being half mile or more from the producer.

Trading in the K-M-A area has been somewhat dormant for a month, with speculators and land owners asking for bids on acreage rather than to set the price. This let-down is due to prospective buyers having loaded up on proved and semi-proved leases that are slated for early development. Field work is expanding steadily, and will continue active beyond the current year.

M. T. Flannigan et al's Texas Land & Mortgage Company 1, NWc J. McCool Survey, A-192, near south bank of the river, is rated as a prospective 2-1/3-mile east extension. This outpost is low structurally, having logged top of lime at 3875 feet, with an elevation of 989 feet. Minor oil saturation was encountered at 4004 feet, and prevailed at intervals to 4061 feet. Hard sand and shale was logged from this point to 4071 feet. Hole may be deepened.

Continental Oil Company's Waggoner Bros. 1-E, offsetting light production in the northwest portion of the old field, tested water in Ellenberger lime at 4224-39 feet, and is plugging back to complete in Strawn sandy-lime. Top of lime was called at 3643 feet, with an elevation of 1056 feet.

Small pumper is assured for Clark-Cowden Drilling Corporation and Southwood Oil Company's W. T. Waggoner 1, A. Gibson Survey, northwest outpost, following nitro shot in Strawn. Hole filled 2500 feet with oil. Water was found in Ellenberger at 3748-3840 feet, with an elevation of 1116 feet. Pipe was cemented at 3600 feet. Top of lime was called at 3420 feet. F. W. Merrick et al's W. T. Waggoner 1, SW SW NE H&TC Section 35, Block 5, farthest northwest outpost, is awaiting nitro shot after plugging back to 3802 feet account of water in Ellenberger at 3745-3814 feet. Top of lime was logged at 3603 feet, with an elevation of 1067 feet.

M. Staniforth et al's Waggoner Bros. 1, SEc lot 9, H&TC Ry. Section 35, Block 7, 1¼ miles southwest of production along the northwest flank of the main field, logged saturated sandy-lime at 3739-53 feet, and has run pipe to test. Favorable structural position was recorded in picking top of lime at 3665 feet, with an elevation of 1105 feet.

Reduced well allowable for K-M-A has been deferred as result of the commission authorizing a 9789-barrel daily quota for the April period. Pending completions will materially increase the daily output, but Sunday production holidays will remain in effect. Top allowable is 58 barrels daily, with a 5-barrel bonus given the comparatively few wells producing below the 4000-foot level.

Volume of active tests at K-M-A continues to gain, but total field operations recorded a slight decrease the past week by reason of the completion of more than a score of flowing wells, and the abandonment of outposts. Currently the field has 60 tests drilling with rotary between casing points, and 74 operations classed as being in process of completion, else standing by to drill cement plugs from the oil string. Surface pipe has been landed on 14 additional sites. Locations, derricks and rigs, aggregating 59, make a total of 207 operations.

Nitro shots are being used more extensively throughout the field to attain flowing production. This method of stimulating oil and gas yield is more effective than acid, and usually results in flowing production. Majority of the current completions register sharp declines in tubing and casing pressure when given the 3-hour potential gauge.

NORTH TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY (K-M-A)—		
H. A. Schaeffer Oil Co., Ferguson 1-A, blk 15	624	3891
ARCHER COUNTY (Panther)—		
Hull, Silk-Helmerich & Payne, Wilson 1, sec 25	3000	3858
ARCHER COUNTY—		
Brown et al, Wallace 2, blk 11	*	1802
Brown & Kriss, Campbell 7, blk 11	*	1308
Duncan et al, Andrews 14, blk 19	*	2047
Smith et al, Longley 1, sec 1839	*	1002
Young et al, Wilson 1, sec 118	*	1409
CLAY COUNTY—		
Bridwell Oil Co., Thornberry 5, blk 5	50	1124
Loesche & Gorman, Thornberry 3, blk 6	249	1108
COOKE COUNTY—		
Texas Co., Truebenbach 5	85	800
Trumter Oil Co., Andress 16	110	798
JACK COUNTY—		
Danciger, Ivy 3	550	3161
Gilmore et al, Hanna 1, sec 3313	*	390
Royal Pet. Corp., Owens-Mitchell 1-C	200	3150
MONTAGUE COUNTY—		
Roy I. Carter Drl. Co., Lemans 1	*	1013
THROCKMORTON COUNTY—		
Deaner et al, Wilkinson 1, sec 934	*	511
WICHITA COUNTY (K-M-A)—		
Blackwell O&G Co., Hodges 5-A	1104	3885
Browning et al, Lewis 2, blk 20	736	3790
J. A. Chapman-Ed. McFarlin, Mangold 1, blk 36	1106	3856
E. C. Oil Co., Hodges 2	848	3812
LeBus-Whitaker 2	840	3834
J. F. Miller 1	584	3882
Gem Oil Co., Waggoner Bros. 1, lot 1	*	4001
Golding & Cochran, Waggoner Bros. 15-A, blk 22	1224	3854
Grace & Woods, Williams 1, blk 13	*	4680
Greer et al, Mitchell-Gulf 1	720	3850
Kadane-Griffith Oil Co., Mangold 4, blk 38	768	3761
Mangold 1-B, blk 39	792	3827
Melat & Graham, Martin 1	1120	3890
Noble et al, Abernathy 1, sec 9	*	4197
Omohundro et al, First Nat'l Co. 3, blk 28	928	3867
Reed, Glass & Crenshaw, First Nat'l Co. 6-A, blk 27	1248	3840
Rowe Bros., First Nat'l Co. 1, blk 26	856	3867
H. A. Schaefer Oil Co., First Nat'l Co. 3, blk 27	1200	3837
J. I. Staley Oil Co., Ferguson 2, blk 2	568	3847
First Nat'l Co. 3, blk 44	1016	3880
Kempner 1, lot 3	520	3840
Texas Co., First Nat'l Co. 24, blk 26	584	3845
Vierson et al, Kempner 1, blk 19	936	3837
WICHITA COUNTY—		
Barton Bros. et al, Honaker 3	*	224
Huff et al, Collins 1	*	4366
Perkins-Cullum, Burnett 14-A, sec 2	273	1530
Burnett 15-A, sec 2	*	1632
Proctor et al, Foster-Allen 27-A	*	3002
Smith et al, Waggoner 1	*	2018
WILBARGER COUNTY—		
Kelly & Wheeler, Waggoner 1, sec 4	*	2400
Paradise Oil Co., Waggoner 3-A, sec 45	251	1907
YOUNG COUNTY—		
Black Gold Oil Co., Fisher 1, sec 455	750	3951
Crenshaw et al, Ragland 1	145	3790
Humphrey et al, Butler 1, sec 462	¶3.6	3947
Duncan 1, sec 461	21	4005
Reese 1, sec 461	¶7	3957
Moran & Sons, Inc., Howard 1, sec 3401	*	985
Piper et al, Scott 5, sec 334	8	745
Post Oak Oil Co., Groves 3, sec 1491	*	964
Sams & Watson, Cullers 5	11	583
D. Wilson et al, Clifton 1, sec 351	*	733
Wo-Mac Oil Co., Webb 1, blk 3	*	780

*Failures; †Junked; ¶Million cu. ft. gas.

EAST TEXAS

Gregg County wildcat test

* * *

drills into Lower Marine

Tyler, Texas.—Penetration of the lower Marine section, potential oil and gas zone in the Woodbine basin, was credited to Humble Oil & Refining Company and Gulf Oil Corporation's Robertson 1, Gregg County wildcat, when streaks of shale appeared in hard sandstone cored at 9280 feet. It is 4 miles east of nearest production in the East Texas field, and was due to reach the base of the Travis Peak, normally about 2000 feet thick, at the above level. This test is commanding more attention than any other deep project in the basin due to its relative position to the East Texas field, and the logging of gas shows in the lower Trinity series.

Exploration of the lower Marine beds under the Kelsey dome, Upshur County, is the next objective of Tom Hunter and American Liberty Oil Company's Carter 1 after financing deepening operations. Drilling was under way at 7960 feet in Travis Peak, topped at 7525 feet. New contract calls for 400-foot penetration in the Marine, due near the 9500-foot level. Fulfillment of this new contract will establish a new depth record for the Woodbine belt.

H. L. Hunt et al's Bradley 1, deep project for the Chapel Hill area, Smith County, 8½ miles west of the East Texas field, logged top of Georgetown at 4400 feet, with an elevation of 460 feet, and was drilling at 4520 feet. On the above marker it is about 75 feet higher on structure than a nearby Woodbine failure.

S. B. Howard, Frank Buttram et al's T. C. Self 1, 3 miles southwest of Athens, Henderson County, was listed as a failure at 5007 feet after showing water in Woodbine topped at 4615 feet, with an elevation of 368 feet. Operations began March 10.

Shreveport, La.—Possibility that the Hill horizon, highest of the Glen Rose producing strata in the Rodessa field, may be productive of gas and distillate on the southwest flank of the Jefferson area, Marion County, Texas, was given last week when Arkansas Louisiana Gas Company's J. C. Pitts 1, Charles Lockhart Survey, which checked 72 feet lower than the discovery well at Jefferson on the anhydrite, showed gas and distillate in a 5-minute drill stem test from 5930 to 5951 feet through ¼-inch chokes at top and bottom, with 125 pounds pressure. The test started coring ahead for the Henderson and Gloyd, both productive at Jefferson.

This test is 2½ miles southwest of nearest production. With elevation of 202 feet, this test recovered a core in the Hill from 5937 to 5944 feet showing gas and distillate. It had topped a stray anhydrite stringer at 4912 feet and topped the regular anhydrite stringer at 5273 feet.

The Texas Railroad Commission has issued an order reducing the maximum gas/oil ratio for wells producing from the Dees-Young horizon in the Rodessa field.

The new order, effective April 1, provides for a maximum gas production of 3500 feet per barrel of oil. The order previously effective permitted production of 5000 feet per barrel.

The order resulted from a hearing March 19, at which operators protested against the continuance of the order providing for the higher ratio. They pointed out that the maximum ratio for similar wells in Louisiana was 2000/1.

EAST TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Adams et al, Arnold 7 (14½-ac)	3500	3710
Atlantic, Thompson 12 (50-ac)	7200	3797
Falls Ref. Co., Bradford 2-A (3.24-ac)	5000	3650
Fischer et al, Wilson 9-A (3½-ac)	6000	3769
W. B. Hamilton Pet. Co., Gambrell 21 (54.7-ac)	6000	3669
Hastings & Dodson, Alford 2 (2¾-ac)	720	3591
Magnolia, Holland 7 (17.47-ac)	3000	3735
Ohio, Mason 17 (103.86-ac)	2400	3682
Regent Oil Co., Harmon 3-A (2-ac)	6500	3761
Ward Oil Corp., Thrash 39 (200-ac)	6000	3782
KILGORE AREA—		
Allen et al, Nolan 3 (3.37-ac)	6400	3614
Gen'l American Oil Co., Smith 12 (39.97-ac)	8800	3589
Geier Bros.-F. B. Jackson, Williamson 8 (200-ac)	700	3680
Williamson 9 (200-ac)	1500	3716
Gulf, Spear 43, Tr. 3 (89.79-ac)	8000	3614
Humble, Laird 94-B (568.53-ac)	4000	3650
Kathleen Oil Co., Peterson 10 (16-ac)	7500	3651
McMahon et al, Laird 15 (45.1-ac)	8500	3635
Navarro, Peterson 12 (42-ac)	8500	3673
Peterson 13 (42-ac)	8300	3674
Nioco Oil Co., Knowles 9 (7.16-ac)	2500	3566
Overton Ref. Co. (was Gold Star), Butts 2 (36/100-ac)	600	3555
Plummer et al, Beall 10 (80-ac)	1500	3701
Roosth-Genecov, Laird 2, blk 154	500	3547
Sells Pet., Sibley 7 (18.16-ac)	2500	3598
Smith et al, Morse 5 (3.45-ac)	7200	3616
Sun, Hilburn-Loyd 38 (133.7-ac)	3000	3680
Tide Water Associated, Blackman 20 (79.14-ac)	3600	3642
Wrather et al, Morris 7 (36.6-ac)	480	3656
LONGVIEW AREA—		
Arkansas F. O. Co., Lee 13 (67.19-ac)	1500	3611
Humble, Edwards 40 (271.6-ac)	7200	3680
L. G. S. Oil Corp., McQueen 5-C (94.54-ac)	40	3600
Looney et al, Shelton 2-A-B (21½-ac) 3rd hole	10	3727
Magnolia, Ziegler 22 (120.62-ac)	7800	3494
Pewitt et al, Porter 7 (66-ac)	750	3717
Williford 20 (133-ac)	1200	3682
H. Shulman & C. J. Atkinson, Mayfield 2 (7-ac)	40	3580
Shell, Bassham 7 (54-ac)	9500	3673
Sinclair Prairie, Moncrief 59 (307.7-ac)	8000	3667
Moncrief 60 (307.7-ac)	8000	3657
Skipper Oil Co., Snoddy 4 (4-ac)	7800	3607
Stanolind, Orms 11 (56.44-ac)	8500	3588
Stanolind-Tide Water, Akin 15 (80-ac)	10,000	3622
Sun, Crosby-Williams 4 (650-ac)	50	3653
FRANKLIN COUNTY (Talco)—		
Humble, Dawson 9 (80.45-ac)	181	4316
LEON COUNTY (Buffalo)—		
Lone Star Gas Co., Melasky 1 (81.98-ac)	¶58	5828
TITUS COUNTY (Talco)—		
Humble, G. A. McPeters 3 (78.26-ac)	292	4270
LAMAR COUNTY—		
Cooper Bros. et al, Hayes 2 (200-ac)	*	703
SMITH COUNTY—		
J. G. Mayo, Housh & Thompson, Inc., J. B. Mayfield 1 (130-ac)	*	4975
MARION COUNTY (Rodessa)—		
Flesh & Hootkins, Whitfield 1, R. Bennington sur	550	6020
Geo. Barham, Beard 1, R. Bennington sur	552	6021
SHELBY COUNTY—		
Gregory et al, George 1, C. C. Tutt sur	*	3906

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHWEST TEXAS

New field found north of Edna in Jackson County.

* * *

Alfred area of Jim Wells County extended northeast.

Corpus Christi.—Jackson County contributed South Texas' newest oil producing area on completion of Henry C. Adams, H. J. Porter et al's J. W. Foust 1, Miocene sand discovery 7 miles north of Edna. The well, in Peter White Survey 17, encountered the sand from 2650-65 feet, and was drilled to 5165 feet. After 7-inch casing was landed at 2715 feet, perforations were made between 2655-60 feet. On 24-hour gauge, Foust 1 flowed 177 barrels of 23.8 gravity oil through 3/16-inch choke. Tubing pressure registered 250 pounds, casing pressure 325 pounds. The well, on geophysical prospect, was drilled on a farm-out from Gulf Oil Corporation.

Recently opened Alfred area of Jim Wells County again was in the limelight with a northeast extension to the oil producing horizon unexpectedly being provided. Smith & Story, Inc.'s Robert Adams 1, 1100 feet from discovery, was flowing pipe line oil into tanks late in the week at the estimated rate of 8 barrels per hour through ¼-inch choke. Casing pressure was at 600 pounds. Operator perforated at 3248-54 feet with 12 shots, after cementing casing on bottom. Only one foot of core had been recovered at the 3200-foot level, and the well was carried to 3372 feet. Electrical formation survey indicated gas sands at 3247-52 feet and 3357-62 feet. Drill-stem test of the lower level showed sufficient for a gas producer at that horizon.

Rowan & Hope, Inc.'s Robert Adams 2 also was turned into tanks flowing several barrels of pipe line oil per hour through small choke, with casing pressure registering 624 pounds. Casing set at 3252 feet total depth, was perforated with 12 shots between 3212-18 feet, sand having been logged at 3215½-20½ feet. Nearly a dozen new locations were staked in the area, several of which are starting operations.

In the same county, but second well in the East Premont area, Magnolia Petroleum Company was preparing to test oil shows encountered above 6593 feet in A. A. Seeligson 8. Seven-inch casing was cemented to 6575 feet.

Turkey Creek

The new 5600-foot producing horizon of Turkey Creek area, Nueces County, definitely was established with Rand Morgan's Fee 1 turned into storage flowing around 10 barrels of oil per hour through 5/32-inch choke. Tubing

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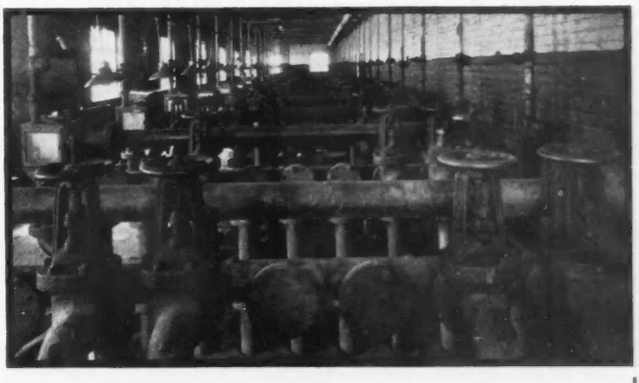

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pressure was 875 pounds, casing pressure 1105 pounds. Fee 1, which is bottomed at 5865 feet, is producing through casing perforations at 5649-53½ feet. The well found salt water in the Douglas sand, and ran electric formation test which indicated the higher level. Operator plans to start several new tests immediately offsetting the well, which also extended the area to the south.

Rutherford Oil Corporation's Louise McKinzie 1, 3300 feet southeast discovery and in Survey 422, had run electrical formation test after coring regular oil sand from 5798-5814 feet. A new horizon for the district was topped at 5382 feet, and drill-stem test recovered 196 feet of pipe line oil, 30 feet oily mud through ⅜ and ¼-inch chokes. In 10 minutes 305 pounds working pressure was gauged. Heep Oil Corporation was providing an extension to the Douglas sand with Louise McKinzie 1, 2750 feet north and slightly east of production. Sand with good oil show was logged from 5809-21 feet and casing set. Sand carrying oil show also was found at 5611-23 feet.

Seaboard Oil Corporation's James P. Luby 13 completed in the Luby field 4300-foot sand after uncovering new level at 5697 feet. Drill-stem test of the 5700-foot sand recovered 43 gravity oil with good pressure in 10 minutes. Salt water was recovered from 5706-21 feet. Ohio Oil Company entered the area with Katherine L. Shaffer 1, direct west offset to Seaboard Oil Corporation's Luby 13. The well will be carried down to the new 5700-foot horizon.

Texon Drilling Company's C. J. Horne extended the South Agua Dulce area on completion as a distillate well, with 1600 pounds pressure. Perforations were between 6275-92 feet. An extension to the west was being given the Agua Dulce pool by Union Producing Company's M. L. Rivers 4-A, which has 5½-inch casing set at 7172 feet. Well was drilled to 7202 feet. Numerous gas and distillate shows were encountered higher in the hole.

Wellington Oil Corporation and Seaboard Oil Corporation's Dugger 2, which indicated 5 new sands for the South Clara Driscoll field, Nueces County, was gauged from perforations 5340-67 feet, made with 29 shots. Through ⅜-inch choke, well flowed 8 barrels per hour of 36.2 gravity oil. Pressures showed 75 pounds on tubing, 400 pounds on casing.

New East White Point area of San Patricio County received a set-back when Smtih Drilling Company's French-Shares 1 recovered 270 feet of oily mud, 2350 feet of salt water with 12 pounds working pressure on drill-stem test from 5682-95 feet. Test, of 15 minutes duration, was through ¼-inch chokes. French-Shares 1 was coring ahead searching for possible pays below the field level. It is 3000 feet east and south of Plymouth Oil Company's Brigham 1, discovery. Three offset tests to the Brigham well were underway.

Plymouth Oil Company's Welder 95-C, opener of Plymouth field's new and deeper producing horizon, was completed for 7½ barrels of crude per hour, flowing through ⅛-inch choke, from perforations at 6156-59 feet. Tubing pressure had registered 995 pounds, casing pressure 1100 pounds. The test showed for a distillate producer from the 5800-foot sand, which corresponds to the Magnolia sand productive in the southern portion of the field, and across a graben.

A gauge of 40 barrels of 46 gravity pipe line oil in 12 hours through perforations at 6365-72 feet was taken of Stanolind Oil & Gas Company's Vandenberge et al 1, 2900-foot southeast extension well to the area recently opened between Placedo and Keeran fields, Victoria County. Production was through 3/32-inch choke, with tubing pressure 1450 pounds, casing pressure 2125 pounds. The well was carried to 6510 feet.

North Sweden extension try is testing in sand

Laredo.—Hiawatha Oil & Gas Company was testing Lillian Parr 9 in an effort to extend the 5500-foot sand of the North Sweden area, Duval County, ½ mile to the east. The horizon was topped at 5513 feet, and 15-minute drill-stem test made from 5505-18 feet. Recovery was 375 feet of oil, 50 feet salt water with 45 pounds pressure through ⅜-inch chokes, top and bottom. Casing was set at total depth. A test from 5407-55 feet had recovered gas-cut mud with small amount of pressure.

Pettus sand production of the North Sweden District was receiving a west extension with Argo Oil Corporation's M. L. Bolte 1, due west outpost to the area, preparing to make production tests of oil sands at 5327-37 and 5348-50 feet. Seven-inch casing was landed at 5323 feet. Drill-stem test of 12 minutes duration recovered 600 feet of oil through ⅜-inch chokes. Pressure was 145 pounds. Bolte 1 is in the northwest quarter of Section 18.

The first producer in the 4500-foot Hockleyensis sand of North Sweden pool, Circle Oil Company's Merle West 2, flowed 233 barrels of oil through 9/64-inch choke on 21-hour gauge. Tubing pressure gauged 925 pounds, casing pressure 1525 pounds. The pay was logged from 4537-52 feet, and 5½-inch casing set at 4532 feet.

In the shallow producing area of the same county, Grady Kirby et al were attempting to provide a short west extension to the Colmena field with Duval County Ranch Company 1, Section 52, testing oil sands from 1440-45 and 1460-62 feet. Casing was set at 1436 feet.

Mountain Townsite Company was trying to complete Fee 5 in an effort to establish Rosenberg sand production in the Oilton area, Webb County. The well cored sands from 2404-24 and 2424-39 feet and casing was run. Fee 5 is about ¼-mile west of Campbell and Killam's E. M. Thompson (Wehr) 5, which was abandoned after producing several barrels oil per day from the sand at 2473-82 feet.

Ezzell production is extended in new sand

Pettus, Texas.—A one-mile southeast extension and the opening of a new producing sand for the Ezzell field of Live Oak-McMullen counties was being provided by Sam Wilson et al's Great American Life Insurance Company 1. Indications on electric formation tester showed the sand to be from 1855-76 feet, although a core was made only from 1860-76 feet. It carried good oil odor.

The Pettus sand was topped at 1921 feet, hole was carried to 1967 feet in salt water sand and 7-inch pipe run at 1906 feet. Perforations were being made late in the week in the new sand around 1855-60 feet.

Water sand was cored between 1490-97 feet. Sands encountered from 1585-93 feet and 1617-29 feet were believed to correspond with pay levels of the Ezzell field. The upper sand carried water, while the top foot of the lower sand showed oil. Elevation of the test is 254 feet, derrick floor, or 233 feet, ground. Location is 330 feet out of the northwest corner of Tract 2456, Section 47, Ezzell Ranch subdivision, W. Duty Survey.

H. J. De Arman and Winward Oil Company's O. G. Drier 1, wildcat five miles northeast of Goliad in Goliad County, was side-tracking hole after cutting out drill stem to 1300 feet. The test is bottomed at 5535 feet and blew

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out several weeks ago from around the 3800-foot sand.

In Bee County, Union Producing Company failed in its attempt to open a Pettus sand pool in G. A. Ray No. 55 just east of Tulsa townsite. The hole was carried to 3879 feet, but no shows encountered below the Pettus topped at 3651 feet.

SOUTH TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
LAREDO DISTRICT		
DUVAL COUNTY—		
Atlantic, Gravis 1, sur 88	*	5833
Circle, West 2 (N. Sweden)	500	4552
Duncan, Worden & Drought 18 (Charamousca)	195	1533
Hickok & Reynolds, Moyer 4 (N. Sweden)	*	5639
Humble, Rossi B-2 (N. Sweden)	185	5356
Magnolia, Duval Ranch 25 (Piedre Lumbre)	60	2043
Petroleum Producers, Worden & Drought 2 (1-B), sur 162	*	1503
Republic, Buoy 6 (N. Sweden)	200	4781
Southwood, Walstad 2 (N. Sweden)	150	5359
McMULLEN COUNTY—		
Ezzell, Fee H-1 (Ezzell)	*	1535
STARR COUNTY—		
Sun, Guerra D-2, La Sacatosa gr.	*	2220
WEBB COUNTY—		
Brooks, Uzzell 2 (Killam-Oilton)	200	2024
Compbell & Killam, Thompson 5 (Killam-Oilton)	*	2482
Cox & Hamon, Garcia 9 (Oilton)	125	1913
Garcia 10 (Oilton)	125	1905
Long 2 (Killam-Oilton)	*	lcn.
Daubert & Lipscomb, Garcia A-3 (Killam-Oilton)	200	2014
Gilcrease, Trafton 1, sur 282 (junked)	*	1945
Jones, Flores 1 (Oilton)	*	lcn.
ZAPATA COUNTY—		
Falcon, Yzaguirre, por 14	*	2275
Kirkwood & Morgan, Hinnant 1 (Mirando Valley)	450	1878
Zapata, M. Garza 10 (Escobas) (dd from 1197)	15	1385
SAN ANTONIO DISTRICT		
BEXAR COUNTY—		
Baker, Baker A-1 (Von Ormy)	2	810
Nus Wald, Trawalter 7 (Von Ormy)	4	610
Watson, Crouch 1 (Eckert)	*	1005
CALDWELL COUNTY—		
Diamond Half, Byrd 3 (Luling)	50	2089
Mee & McNeill, Cosey 4 (Luling)	45	2119
Wilson, Cooke 1 (Salt Flats)	100	2552
EDWARDS COUNTY—		
Auld, Henderson 1, sec 46	*	4224
GUADALUPE COUNTY—		
Chiquita, Tadlock 1 (Darst Creek)	115	2628
CORPUS CHRISTI DISTRICT		
ARANSAS COUNTY—		
Tusca, Murray 2 (McCampbell) (oil sand 6796-99)	800	7135
CALHOUN COUNTY—		
Humble & Plymouth, Welder 14-B (Heyser)	*	5601
HIDALGO COUNTY—		
Sun, Krebs 1, blk 16	*	5218
Union Sulphur, American 12 (Mercedes)	¶150 & 10	7490
JACKSON COUNTY—		
Magnolia, West 1, Morgan sur.	*	8527
LIVE OAK COUNTY—		
Chew & Hantho-Nelson, Bell 1 (Dougherty) (Parks sur) (perf 5076-78)	¶3	5290
Hickok & Reynolds, Land Bank 1, Henry sur	*	1808
NUECES COUNTY—		
Humble, State 1, tr 13 (Flour Bluff)	*	6712
Morgan, Fee 1 (Roberts sur, Turkey Creek) perf 5649-53½)	750	5859
Phillips, McKenzie 2 (Turkey Creek	625	5826
McKinzie 3 (Turkey Creek)	1050	5831
Renwar, McKinzie 3 (Turkey Creek)	675	5834
Seaboard, Luby 13 (Luby) (perf 4342-45½)	400	5721
Luby 15 (Luby)	500	5072
Wellington & Seaboard, Dugger 2 (S. Clara Driscoll) (perf 5340-67)	475	5505
SAN PATRICIO COUNTY—		
Plymouth, Welder 95-C (Plymouth)	450	6159
Welder 96-C (Plymouth)	450	5479
VICTORIA COUNTY—		
Stanolind, Vandenberg 1 (Benavides sur, Placedo-Keeran) (perf 6365-72)	200	6510
Sun, Coffey 7 (Heyser)	150	5750

*Failures; †Junked; ¶Million cu. ft. gas.

Willacy County test may go to 12,000 feet

Mission — Southeastern Willacy County may receive a 12,000-foot test, as Magnolia Petroleum Company plans to set 9⅝-inch casing preparatory to drilling ahead in F. Armendiaz 1. The well is located south of Raymondville and in Share 4 of San Juan de Carricitos grant. In the same county, but northwest of Raymondville, Sal Vieja Oil Corporation's Garcia Land & Cattle Company 2 continued to make hole. As the week closed, test was progressing below the 7750-foot level.

Starr County's wild well was brought under control and efforts were being made to recover drill stem stuck a few feet off bottom at 6609 feet. This well, J. L. Collins & Company's Guerra 1, in the northwest portion of the county, blew some brown colored 40.4 gravity oil (corrected) and little salt water from sand at 6605-9 feet, while making estimated 40,000,000 cubic feet gas per day.

First completion in some time in the Mercedes deep field of Hidalgo County was being effected by Union Sulphur Company's American Rio Grande Land & Irrigation Company 12. As the week closed, the well was flowing around 70 barrels of oil and 5,000,000 cubic feet of gas through ⅜-inch choke. Pressures registered 1500 pounds on tubing, 1700 pounds on casing. The productive sand is from 7468-84 feet, 7-inch casing having been set atop the horizon.

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Jack Frazier hits again near Houston city limits.

* * *

Outpost 8000 feet east of Fairbanks produces oil.

* * *

Leasing brisk east of Genoa near West's wildcat.

Houston.—Jack Frazier discovered his second oil field in the Texas Gulf Coast March 23, when Vollmer 1, 2000 feet northwest of the city limits of Houston, Eureka area, J. Rienerman Survey, Harris County, came in flowing 20 barrels 33.5 gravity pipe line oil per hour through a quarter-inch choke from Yegua sand at 7730 feet. Tubing pressure was 825 pounds and casing pressure was 1000 pounds. Vollmer 1 was perforated with 47 shots from 7697 to 7722 feet, and 30 feet of screen was set. After washing the well failed to kick off and swabbing was commenced. The hole was swabbed only six times and it started flowing wash water. It was turned into burning pits and started flowing oil and wash water. No salt water was shown.

Vollmer 1 logged 33 feet of oil sand from 7690 to 7723 feet. Five and half-inch casing was set at 7730 feet.

Previously Gas Field

Eureka was discovered as a gas field in 1934 by C. B. Bunte et al. The discovery well produced a lot of gas and distillate. Then Houston Oil Company drilled a well in the area; it also produced gas and distillate. It is understood the production was around 2500 or 3000 barrels of distillate each month.

Operators at Eureka were under the opinion that the area would only produce gas. Several large tracts were dropped. Then Frazier went in and leased over 1000 acres for oil development. His first well proved the gas field would produce oil. Royalty is being sold at $800 per acre base near the discovery well.

Frazier's first oil field in the Texas Gulf Coast was at Hardin, Liberty County. Since the discovery of the field it has become one of the most active in the Coastal country.

Location has been made by Frazier for Varner Realty Company 1, 4850 feet west of the east line and 1330 feet north of the south line of J. Reinerman Survey. It is a southwest offset to the discovery well. Tide Water Associated Oil Company holds acreage northwest and probably will drill a well soon.

Extension at Fairbanks

Eight thousand feet east of production at Fairbanks, Harris County, Amerada Petroleum Corporation and Stanolind Oil & Gas Company's White 1, J. Clarkson Survey, made 71 barrels in three hours, eight percent water, through a quarter-inch choke last week. Tubing pressure was 1050 pounds and casing pressure was 1200 pounds. White 1 was completed at 6855 feet.

Over a mile southeast of the discovery well at Fairbanks, H. E. Williams is working over Vega 1, G. Williams Survey at 6823 feet, after it came in flowing oil and salt water. Perforations from 6822 to 6834 feet were squeezed with cement. The previous week the well came in flowing an estimated 25 to 30 barrels per hour through a quarter-inch choke. Pressures were 650 and 850 pounds.

East of Genoa, Harris County, West Production Company's Sowden 1, J. Lindsey Survey, is being watched with much interest. Last week the well was at a reported depth of 4600 feet and was fishing. No information is being given out on the wildcat, but due to the location of the test, it stands a good chance of hitting oil. It is in the region of Friendswood, Hastings, Genoa and in a section of the county where sand conditions are good.

Genoa Leasing Brisk

Leasing in the area of the West Production Company's wildcat has been brisk. Last week over $280,000 was spent for leases. E. I. Thompson is reported to have purchased the Myrtle Sweden undivided half interest in 200 acres for $40,000 cash and $100,000 in oil payments. Thompson also purchased a lease on George M. Sowden's undivided half interest in 200 acres, 300 fee acres, and also a quarter of the minerals for $65,000 in cash and $75,000 in oil payments. It is understood that leases were assigned to E. E. Fogelson of Houston.

In the Pearland area, Brazoria County, Albert Plummer's Street 1, Hunter Survey, was abandoned last week at 6357 feet in salt water sand. The well cored over 500 feet of salt water sand. No shows of oil were reported. Street 1 is reported to have run around 700 feet higher than other wells drilled in the district. Geologists are of the opinion that there is a fault running in the area and that Street 1 was on the down throw side.

Sam Dunnman's Settegast 1, also in the Pearland area, T. J. Green Survey, Brazoria County, was down to 6244 feet last week in salt water sand. The sand was reported topped around 6224 feet. The well is reported to be running lower than Plummer's Street 1.

In the Hungerford area, Wharton County, Cockburn & Hargrove's Hudgins 1, M. Muldoon Survey, was abandoned last week at 7530 feet. Salt water sand was logged at 5117 feet. The wildcat created considerable excitement last week when it attempted to blow out below 6000 feet. It was drilled 500 feet below the top of the Cockfield and no sand was logged.

Pan American Production Company was preparing to perforate casing in E. Richers 1, South Bay City I. & G. N. No. 3, last week at 9695 feet. Seven-inch casing was set at 9668 feet. Sands will be tested from 9500 to 9600 feet.

Gas in Dickinson Extension

Thirty five hundred feet south of production at Dickinson, Humble Oil & Refining Company is preparing to complete Fream 1, J. Sellers Survey, as a gas well. The hole was drilled to 8908 feet and 7-inch casing was set at 8898 feet. Casing will be perforated at 8606 to 8612 feet and at 8793 feet.

On the south side of Orange field, Orange County, J. M. Campbell abandoned Scales 1, Wm. Dyson Survey, at 5948 feet after testing salt water sands.

On the southwest side of Orange, Shell Petroleum Corporation's first well, Loeffler 1, Wm. Dyson Survey, was coring in sand showing oil at 5962 feet

Notice of Sale of Oil and Gas Lease

W. L. Webber, Receiver of the Security State Bank, Scranton, Kansas, will, on the 31st day of March, 1938, at two o'clock, P.M., in the Office of the State Bank Commissioner of Kansas, offer for sale to the highest bidder for cash in hand the following described property:

An oil and gas lease covering the following described land in the County of Linn, State of Kansas: "The Northwest Quarter (¼) of Section 11, Township 20, Range 23; also the North Half (½) of the Northeast Quarter (¼) of Section 10, Township 20, Range 23 and the Southeast Quarter (¼) of the Northeast Quarter (¼) of Section 10, Township 20, Range 23, all in Linn County, Kansas, containing two hundred and eighty (280) acres more or less."

There are three power and storage plants and approximately fifty-four equipped oil wells on this property.

Written bids will be received if accompanied by a bank draft or certified check up to two o'clock, P.M., on the date of sale.

W. L. WEBBER
Receiver, Security State Bank
Scranton, Kansas
Topeka, Kansas

and probably will drill a few feet deeper before running an electrical logging device and setting casing. Top of the sand was logged at 5945 feet. North of production, Union Producing Company's Lutcher Moore 2, J. Dyson Survey, was coring in salt water sand at 6434 feet. After logging sand showing oil from 6364 to 6376 feet the operators made a drill stem test from 6362 to 6376 feet. It showed 900 feet of oil and gas and 1900 feet of salt water and oil. The test was made in 12 minutes through quarter-inch chokes and showed a pressure of 21 pounds.

The Texas Company's Polk A-5, south of Polk A-6, which discovered a new sand on the flank of Port Neches field, Orange County, M. E. Hall Survey, was abandoned at 6508 feet in salt water sand. Top of the sand was encountered at 5970 feet.

Best Well Extends Hardin

The best well to be completed on the west side of Hardin field, Liberty County, is Sun Oil Company's Hissy 1. It also extended the field west. Hissy 1 made an estimated 25 barrels per hour through a quarter-inch choke at 7674 feet. Tubing pressure was 950 pounds and casing pressure was 1000 pounds. Top of the oil sand was logged at 7648 feet and 7-inch casing was set at 7644 feet.

Sun Oil Company completed two wells at Seabreeze field, Chambers County. Seabreeze Land Company 1, northeast extension well, H. & T. B. Section 102, was completed as a gas well. It made two million cubic feet of gas daily at 8860 feet.

In the Double Gum Bayou area, Chambers County, Laverne Decker's Broussard Trust 1, H. & T. C. Section 30 was abandoned in Frio salt water sand at 7381 feet.

On the northwest side of Silsbee field, Hardin County, Humble Oil & Refining Company abandoned Kindendall 1, G. W. Brooks Survey at 7050 feet. It is a north offset to Republic-Production Company's Howell 1.

In San Jacinto County, Gibbs Brothers & Company et al have made location for Gibbs Brothers 1, 3792 feet west, thence 400 feet north from the southeast corner of the Chas. McKinn Survey. Continental Oil Company is reported to have considerable acreage in this area.

In the McCrosky area, Matagorda County, Superior Drilling Company made a drill stem test on Paul Kruger

TEXAS GULF COAST
Completions

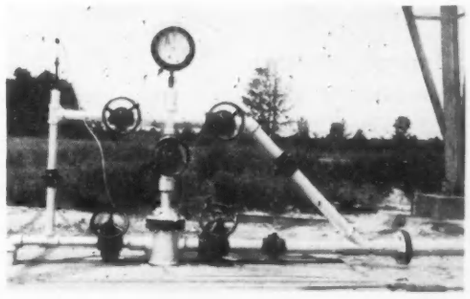
Company, Well and Location	Init. Prod. Bbls.	Depth
ANAHUAC—		
Humble, Tyrell 23	680	7085
CONROE—		
Rutherford, McComb 1	555	5105
DICKINSON—		
Atlantic, Jones 2	442	8133
Frank W. Bennett, Schroeder 4	535	8120
Humble, M. Stewart A-22	531	9026
FANNETT—		
Gulf, Spencer 1	*	7293
HANKAMER—		
Gulf, Boyt 27	285	2946
HARDIN—		
Halliburton Oil Prod. Co., Hanchey 1	605	7266
Humble, McMurtry 1	450	7569
Sun, Hissey 1	600	7674
HASTINGS—		
Humble, McDeed 9	624	6098
Shindler 7	584	6080
Navarro Oil Co., Beers A-3	286	6105
Stanolind, Drake 18	568	5835
Stockwell 2	630	6080
HITCHCOCK—		
Red Bank Oil Co., M. Stewart 1	*	6611
HULL—		
Texas Co., Hannah Fee 10	10	5462
MANVEL—		
Texas Co., Morrison 4	560	5680
ORANGE—		
J. M. Campbell, Scales 1	*	5989
PORT NECHES—		
Texas Co., Polk A-5	*	6508
SEABREEZE—		
Sun, Seabreeze Land Co. 1	¶2	8889
White 1	600	8485
SILSBEE—		
Republic, Fee 28	480	6973
SOUTH BAY CITY—		
Smith & McDaniels, Gaines 1	207	8165
SPURGER—		
Republic, Hurd 8	520	7695
TOMBALL—		
Amerada-Stanolind, Bell 1-A	371	5593
Humble, Kuehn 6	240	5560
VAN VLECK—		
Skelly Oil Co., First National Bank 2	340	8250
Moore 3	544	7495
WEST BEAUMONT—		
Stanolind, Keith Dowling 2	128	5397
WITHERS—		
Texas Co., Pierce Estate C-45	290	5550
BRAZORIA COUNTY—		
Albert Plummer, Street 1, Pearland prospect, Hunter sur	*	6357
CHAMBERS COUNTY—		
Laverne Decker, Broussard Trust 1, Double Gum Bayou area, H&TC Sec 30	*	7381,
WHARTON COUNTY—		
Cockburn & Hargrove, Hudgins 1, Hungerford area, M. Muldoon sur	*	7530

*Failures; †Junked; ¶Million cu. ft. gas.

In the Tri-State Area

BRYAN VALVES Lead

3 TO 1



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1, C. Warren Survey, at 6700 to 6704 feet which showed 400 feet of mud with a slight show of gas and salt water. The test was made through quarter-inch choke. Coring continues.

Mobile, Ala.—H. A. Stebbinger of Shreveport and Fort Worth has taken a block of approximately 15,000 acres of leases in townships 9 and 10, ranges 25 and 26, Barbour County, Alabama, just southwest of the town of Clayton, for a contemplated 6000-foot test. Geological work was done by W. R. Julian of Shreveport.

D. K. SMITH, manager of Globe Petroleum Company at Tampico, Mexico, has returned to headquarters after a week's trip to San Antonio, Texas.

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Are you doing anything to prevent WAR?

WRITE FOR INFORMATION

SOUTH LOUISIANA

New field half mile south of university campus.

* * *

Well in Gulf of Mexico makes 11 barrels per hour.

* * *

Union Sulphur is testing new sands in two fields.

Lake Charles.—The first oil field to be discovered in East Baton Rouge Parish is four miles south of Baton Rouge, the capital of Louisiana, and a half mile south of the campus of Louisiana State University. The new discovery is on the old University block which was drilled by Superior Oil Company in 1935.

March 21, Louisiana Crusader Oil Company made a production test on Duplantier 1, Section 65-7s-1w, and it came in flowing oil and wash water from Miocene sands at 6477 feet. On the first 24-hour gauge it made 520 barrels of 33.2 gravity oil, five percent wash water and mud, through a 3/16-inch choke with a tubing pressure of 990 pounds. No gauge was taken on the casing. Duplantier was also making 500,000 cubic feet of gas daily.

At one time Superior Oil Company held this block, and after drilling Duplantier 1 below 10,360 feet and testing sands from 6000 to 7000 feet, which showed 33 gravity oil, the well was abandoned. Superior Oil Company then dropped several thousand acres in the area. William Helis and Louisiana Crusader Oil Company then leased approximately 2500 acres. Two dry holes were drilled by them before moving to Duplantier 1, which is 400 feet south of Superior Oil Company's dry hole. Then they drilled the discovery well to 6477 feet in sand showing oil after logging top of the sand at 6464 feet. However, the first broken show was encountered at 6450 feet. After running an electrical logging device, seven-inch casing was set at 6472 feet, and 5 feet 5 inches of screen set.

Superior Still in Play

Superior Oil Company still holds around 1800-acres south of the discovery well and probably will make a location soon. The University block was shot by reflection seismograph in 1935 by Hoard Exploration Company.

On the southwest flank of West Hackberry field, Cameron Parish, Superior Oil Company's Benson-Vincent 1, Section 30-12s-10w, blew out again last week after the crew had recovered stuck drill pipe at 6224 feet. The previous week the operators drilled into a sand at 6224 feet and the well blew out and bridged lodging the drill pipe. After pipe was recovered, the hole was cored to 6277 feet in sand and shale. It blew out again and the pipe was stuck. Benson-Vincent 1 is about two miles southwest of production.

Well In Gulf Flows

One mile off the shore of Cameron Parish, Superior Oil Company made another test on State 1, in Gulf of Mexico, after setting screen and liner. The well made 22 barrels in two hours through a 16/64-inch choke, with a tubing pressure of 850 pounds. State 1 came in the previous week making 10 barrels per hour after casing was perforated from 5110 to 5130 feet with 38 shots. No screen was in the hole. Operators pulled tubing and set screen. The well is shut in for storage.

Union Sulphur Company is preparing to test new sands at Big Lake and Sulphur. At Big Lake the operators perforated casing in J. O. Hebert 2, Section 18-12s-8w, for salt water shut-offs from 6760 to 6808 feet. At the end of the week the company was drilling cement plugs and will perforate casing for a production test of sand which were logged in Miami Corporation 1 from 6765 to 6800 feet. This is a new sand for the field. Last week, the operator's Miami Corporation 1 was down to 8670 feet in shale and was drilling ahead. This well logged oil sands from 6765 to 6800 feet which showed high porosity and resistivity on an electrical logging device.

At Sulphur, Calcasieu Parish, Union Sulphur Company's Fee 857, Section 29-9s-10w, was waiting on cement to set at 6495 feet, where seven-inch casing was set. The flank well logged sand showing oil from 6450 to 6005 feet. On a drill-stem test it showed five fourbles of oil and mud in five minutes through quarter-inch chokes.

In the Little Cheniere area, Section 7-14s-6w, Cameron Parish, Humble Oil & Refining Company's Miami Corporation 1, was down to 9000 feet in hard sand last week. Salt water sands were reported in the test around 8640 feet.

New Sands at Jennings

On the southeast flank of Jennings, Acadia Parish, Stanolind Oil & Gas Company's Houssiere Latrielle 19, Section 47-9s-2w was plugging back to 6080 feet after drilling to 7616 feet. A show of oil was logged from 7530 to 7540 feet. This flank test has logged several new

sands on the southeast flank of the field.

At North Crowley, Acadia Parish, Humble Oil & Refining Company's Trahan 1, Section 3-9s-1e, was drilling at 9276 feet last week and is below the pay sand. The company's Smith 1 was drilling in shale at 8075 feet and, according to reports, has not picked up the producing sand yet.

Continental Oil Company is waiting on cement to set in Hirsch 1, Section 44-3s-2e, Evangeline Parish, Villa Platte field. The well is 3000 feet south of production. Hirsch 1 was drilled to 9040 feet in shale and seven-inch casing was set on bottom. The same operator's Tate 1 was preparing to set casing at 9062 feet after electrically logging oil sands.

In the Abbeville area, Vermilion Parish, Continental Oil Company's Faulk 1, Section 66-12s-3e, was down to 9000 feet and running an electrical logging device after having missed the regular producing horizon.

Port Barre Extended

Flank production on the west side of Port Barre, St. Landry Parish, was extended a half-mile north last week when Pan American Production Company completed Cormier 4, Section 4-6s-5e, for 600 barrels daily through a quarter-inch choke, with a tubing pressure of 670 pounds and a casing pressure of 850 pounds at 4978 feet. Top of the oil sand was encountered at 7960 feet and seven-inch casing was set at the top of the sand.

At Sorrento, Ascension Parish, Pan American Production Company's United Lands 9, Section 15-10s-4e, was below 1800 feet last week after logging 28 feet of sand showing oil from 898 to 926 feet. This is a new sand.

North of the discovery well at Horseshoe Bayou, St. Mary Parish, The Texas Company was drilling in sandy shale with odors of oil at 10,789 feet last week. Sands with an odor of oil were logged from 10,695 to 10,722 feet. The well will be drilled to the 10,873-foot sand.

What is believed to be the longest string of 9⅝-inch casing ever set in South Louisiana was in Fohs Oil Company's Buckley 1, Section 77-19s-17e, Dulac prospect, Terrebonne Parish. The hole was drilled to 9651 feet and the string of casing was set to that depth.

Tide Water Oil Company completed another well at Venice, Plaquemines Parish. Manhatten Fruit Company 6 came in from 7200 feet making 130 barrels daily through a 3/16-inch choke for 15 hours and a ⅛-inch choke for four hours. Tubing pressure was 1100 pounds.

At South Elton, Jefferson Davis Parish, Stanolind Oil & Gas Company and Amerada Petroleum Corporation's Calcasieu National Bank 3-B was drilling in shale at 12,525 feet. It is the deepest well in South Louisiana.

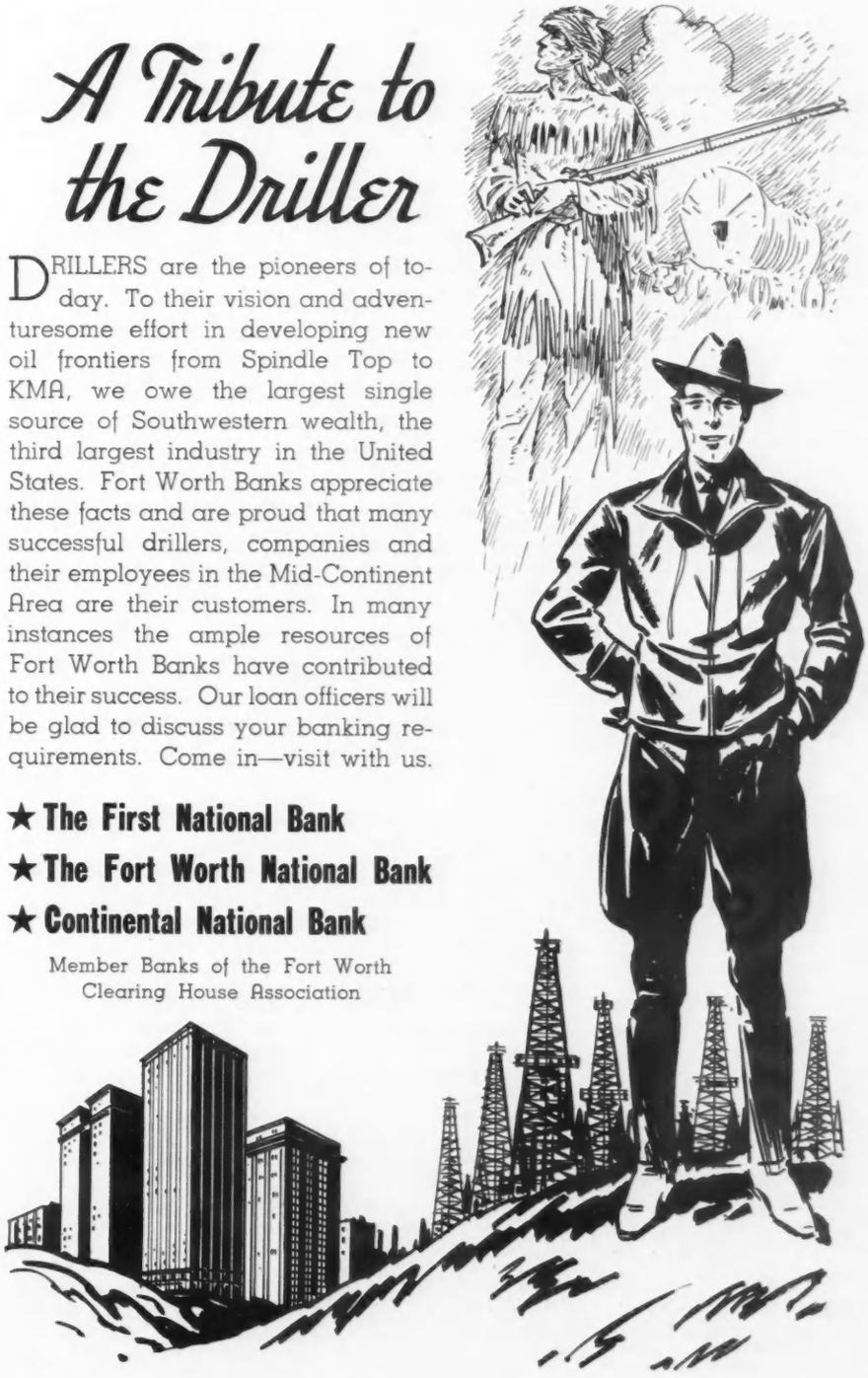
Shreveport.—Thirty drilling permits were authorized last week by the Louisiana Conservation Commission of which ten were for North Louisiana parishes, as follows: Bossier, 1; Claiborne, 1; DeSoto, 2; Lincoln, 2 (both in Lisbon); Natchitoches, 1; and Webster, 3, all in Cotton Valley. The twenty in South Louisiana were divided among the following parishes: Acadia, 3; Ascension, 1; Avoyelles, 1; Cameron, 4; Concordia, 1; Evangeline, 1; Iberville, 1; Jefferson Davis, 1; LaFourche, 1; Plaquemines, 2; St. Martin, 1; St. Mary, 2; and Terrebonne, 1.

SOUTH LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CHARENTON—		
Pan American, Lawes 5	215	1890
EDGERLY—		
Louisiana Crusader, Louisiana Prairie Co. 1	*	4575
GARDEN ISLAND BAY—		
Texas Co., State 26, dr to 7200 ft, pb and comp. 4148 ft	550	4148
LAFITTE—		
Texas Co., Marrero 2, dr to 10,187 ft, pb and comp 10,098 ft	1300	10,098
NEW IBERIA—		
Texas Co., Hanszen B-10	550	5230
PORT BARRE—		
Pan-American, Cormier 4	600	4978
ROANOKE—		
Humble, DeVillbiss B-11	360	8842
SULPHUR—		
Union Sulphur, Fee 852	*	5193
VENICE—		
Tide Water, Manhatten Fruit Co. 6	140	7200
CALCASIEU PARISH—		
Shell, Calcasieu National Bank 1, Hayes area, 18-11s-5w	*	9073
EAST BATON ROUGE PARISH—		
Louisiana Crusader, Duplantier 1, University Block, 65-7s-1w	520	6477
CAMERON PARISH—		
Superior, Gulf of Mexico 1, in Gulf of Mexico, 1 mi off shore Cameron Parish, dr to 9394 ft, pb and comp. 5180 ft	552	5180

*Failures; †Junked; ¶Million cu. ft. gas.


A Tribute to the Driller
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May have gas-distillate producer at Blanchard.

* * *

Oakes' completion extends Lisbon field west.

Shreveport, La. — Indications were seen last week of a Travis Peak gas-distillate producer for the Blanchard district, Caddo Parish, when A. O. Olson and associates' Sharp 1, C NW NE 10-18n-16w, tried to blow out Thursday following perforation of seven-inch casing, and was shut in for installation of connections.

This test with elevation of 265 feet logged porous lime in Travis Peak with a showing of gas and a stain of distillate from 5990 to 6010 feet. Total depth is 6061 feet (corrected). Casing was perforated from 5994 to 6002 feet and from 6009 to 6019 feet. Two small gas-distillate wells have been completed in Section 10-18n-16w, to the south of the present test, both being in the Glen Rose lime.

Magnolia Petroleum Company was drilling ahead last week below 8538 feet in Frank Sexton 1, C SW NE 32-23n-9w, deep test in the shallow Shongaloo field, Webster Parish, after electrical logging device was run to 8520 feet, 8500 feet being contract depth. It will be taken to 8800 feet. Although this test logged showings of gas at 8290-8303 feet and at 8370 to 8374 feet, in lower Marine that was identified as the Bodcaw that produces gas and distillate at Cotton Valley, was logged at 8033 to 8060 feet and was hard, tight and dry. Elevation is 225 feet.

Production in the Lisbon field, Claiborne Parish, was pushed one location farther west when E. T. Oakes and associates completed Sallie Lloyd 2, SE SE 3-20n-5w, at 5328 feet, flowing 75 barrels per hour after acidization. Two and one half miles northwest of Lisbon production, C. R. Schuster and associates made location for E. C. Kilgore 1, NE SE 28-21n-5w, Claiborne Parish, on a 327-acre tract. This test is one half mile southwest of a test drilled several years ago by Dixie Oil Company to 5034 feet, which lacked about 300 feet of reaching the Lisbon producing horizon in the basal Glen Rose. This was before discovery of the field.

The fourth producer and what appears to be the best one, was completed last week in the recently opened 3100 foot horizon of the Sligo field, Bossier Parish, in the upper part of the lower Cretaceous by Triangle Drilling Company, owner of all four of these wells, in Skannal C-2, SW NE 13-17n-12w, which was closed in after filling a 500-barrel tank in first 12 hours. It was completed following treatment with 2500 gallons of acid. Total depth is 3121 feet.

J. G. Sutton and associates were still trying last week to complete Sabine Lumber Company 1, SE NW NE 23-7n-13w, that showed for an oil well in drill stem test in the Washita at 3856 feet. The well was acidized with 3000 gallons following preliminary treatment with 750 gallons but refused to flow. It would open a new producing horizon in the shallow Blue Lake (West Zwolle) field, Sabine Parish.

Petroleum Heat and Power Company was trying to extinguish a fire at W. R. Williams 1, Section 13-12n-11w, DeSoto Parish, in a newly opened nose off the Bull Bayou (Dolet Hills) district, which caught fire as operators prepared to drill plugs and test in the Tokio at 2827 feet.

On the southwest edge of the Cotton Valley field, Webster Parish, Magnolia Petroleum Company was testing Crichton 1, NE NE 33-21n-10w, in the Travis Peak (Holloway) sand after 11 feet of saturation was logged. Total depth is 5782 feet. If completed at present depth it would make the seventh Travis Peak oil well in the field.

Hunter and Rowe's (formerly W. J. Furlong, Jr.), E. M. Clark 1, Section 10-20n-7e, Morehouse Parish wildcat, was coring black shale and lime at 6874 feet. Joe Modisett and associates' Frost Lumber Company 1, NE SW 14-21n-1e, Union Parish wildcat, was coring sand in lower Marine at 8271 feet. Gulf Refining Company's Goodpine 1, SE SW 25-14n-8w, Bienville Parish wildcat, was coring red and black shale at 9190 feet.

Union Producing Company and associates spudded a test on the north edge of Sugar Creek, Claiborne Parish, Coleman 1, SW SE 30-20n-5w.

M. L. Stephens made location for a proposed 6000-foot test, M. E. Garrett 1, NW NE 10-11n-16w, DeSoto Parish, near Logansport. In the same area S. S. Alexander's Stell 1, Section 5-12n-16w, a workover job, was finally cleaned out despite frequent headings of oil and salt water, and electrical log run to bottom at 6002 feet. Origin of the oil which has been seeping from hole since abandonment several months ago is sought.

In Catahoula Parish, southwest of Sicily Island and centering around Section 8-9n-7e, The California Company has assembled a block of leases on a 10-year commercial basis. In Claiborne Parish in township 22 north, range 5 west, Shell Petroleum Company is adding to its holdings. Standard Oil Company of Louisiana has a shooting unit southwest of the old shallow Haynesville field, Claiborne Parish, in township 22 north, range 8 west. Atlantic Refining Company continues to keep a seismograph in Union Parish in township 21 north, range 1 east. Hunt Oil Company secured NE SE and SE NE 24-21n-10w, Cotton Valley district, Webster Parish, from Pardee Lumber Company with a drilling proviso to start a test by June 1.

Magnolia Petroleum Company has a seismograph unit working in northeastern Cass County, Texas, near Spring Lake. In Shelby County, Texas, near three Glen Rose gas-distillate producers at Joaquin, Grady Vaughn will start a test within 60 days on the west 100 acres of the H. L. Brooks Survey, on Pickering Lumber Company fee. Humble Oil & Refining Company is filling in a block north of Center, Shelby County, Texas.

NORTH LOUISIANA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO PARISH (Rodessa)—		
Standard, Spearman 2, 3-23n-16w...	332	5972
Shell, U. S. Government B-1, 3-23n-16w	240	5973
CLAIBORNE PARISH (Lisbon)—		
Hollyfield & McFarlane, Patton Est. 3, 2-20n-5w	840	5249
Oakes et al, Lloyd 2, 3-20n-5w	960	5328
A. O. Olson, Patton A-8, 30-21n-4w	840	5085
McMurray et al, Bean 2, 32-21n-4w..	480	5174
DE SOTO PARISH (Bull Bayou)—		
Petroleum H. & P. Co., Matthews 1, 30-12n-11w	¶6½	2505

*Failures; †Junked; ¶Million cu. ft. gas.

Two completed in lower Marine in Schuler field.

El Dorado, Ark.—Two new lower Marine (Jones sand) wells were completed last week in the Schuler field, Union County, one of which extended production one fourth mile southeast. This test, however, had found the Permian lime just below the Jones sand, to carry salt water. The well was completed in the lower Marine without any trace of the salt water. This well is Phillips Petroleum Company's Marine 1, NE NW NE 20-18-17, completed flowing 639 barrels in first 13 hours through 24/64-inch tubing choke, after 7-inch casing cemented at 7617 feet, was perforated at 7528 to 7535 feet and from 7560 to 7563 feet. Total depth is 7640 feet; elevation 223 feet. Jones sand was topped at 7527 feet and the Permian lime, at 7620 feet. After first 13 hours the well was choked down to the 700-barrel daily allowable per well in this horizon.

The other completion was Marine Oil Company's Fee 4, NW SW SW 17-18-17, which with elevation of 214 feet topped Jones sand at 7519 feet, cemented 7-inch casing at 7578 feet. Total depth is 7590 feet.

Other operations testing at Schuler in the Jones sand are Marine Oil Company's Justiss 3, NEc Lot 7 NW 18-18-17, total depth 7590 feet, and Phillips Petroleum Company's L. Rosen 2, SW NE 18-18-17, which with elevation of 241 feet topped Jones sand at 7531 feet and topped Permian lime at 7637 feet, total depth is 7700 feet.

Alice Sidney Oil Company's P. M.

Powledge 1, SE SW SE 7-18-17, north outpost test, topped Jones sand at 7577 feet, with elevation of 257 feet, found good saturation in 61 feet in that horizon, and is coring below 7712 feet. There are 28 active operations under way at Schuler.

The Arkansas Board of Conservation last week ordered a series of bottom-hole pressure tests on 10 lower Marine wells at Schuler to determine amount of pressure decline.

Testing of what gives promise of being the second oil producer at Buckner, Columbia County, Arkansas, was delayed last week when fire destroyed derrick at Standard Oil Company of Louisiana's S. T. Crone 1, C NW SE 8-16-22, which has just been rebuilt and operators have gone into hole to screw on 7-inch casing stuck while being run after electrical tester was run following logging of saturated Permian lime from 7264 to 7272 feet.

However, three fourths of a mile southwest of the discovery well in SW SW 8-16-22, the same company had completed fishing job in Bodcaw-Barbara 1, C SE NE 18-16-22, and was coring for saturation at 7278 feet. The same company's W. P. Phillips 1, SE SE 15-17-19 at Village, was coring in Travis Peak at 5323 feet.

Kerr-Lynn Oil Company was pulling 5½-inch casing cemented at 7720 feet in Barnett 1, SE SW NE 14-17-20, Columbia County, to re-run the string. A leak between this string and 7-inch cemented at 7051 feet, is blamed for the appearance of salt water in swabbing. Casing had been perforated at 7623-51 feet, well above the water level. Total depth is 7740 feet in Permian lime.

Standard Oil Company of Louisiana has finished detailing with seismograph block around Section 30-18-14, Union County, held by Root Petroleum Company. In the same township and range Kerr-Lynn Oil Company has a seismic unit and in Township 18, Range 15, Tide Water Associated Oil Company has a shooting unit. Magnolia Petroleum Company has a seismograph crew working south of Schuler in Township 19, Range 17.

One and one-half miles northeast of Kerr-Lynn Oil Company's Barnett 1, L. A. Longino made location for Baker 1, NW NW 12-17-20 and secured permit from the Arkansas Board of Conservation to drill the test. This area is about mid-way between the Buckner and Schuler fields.

Two additional Permian lime wildcats for south Arkansas were indicated last week in blocks assembled for early development, one in Calhoun County, and the other in Columbia County.

In townships 13 and 14, ranges 13 and 14, near Hampton, Calhoun County, northeast of the Smackover-Snow Hill area, C. E. Murdock of El Dorado has assembled a block for a Permian lime test to start by next May 1.

In Columbia County near the village of Experiment and centering around Section 15-18-22, R. G. Lawton has acquired acreage for a proposed 9000-foot test. Tide Water Associated Oil Company, Sun Oil Company and R. E. Wyche, Jr., continue to acquire leases in township 15, range 20, Columbia County, as does H. L. Hunt, who is also leasing in township 15, range 21.

Fohs Oil Company is arranging to check with seismograph a block assembled by A. V. Erwin in LaFayette County in the southern part of township 18, range 26, and the northern part of township 19, range 26. Shell Petroleum Corporation and Standard Oil Company of Louisiana each has a shooting unit in township 14, range 20, Nevada County, southeast of the town of Waterloo.

Miami, Florida.—Thomas Kenney and Bert Smith of Orlando, Florida, recently acquired a 20,000-acre lease on land and water around Bahia Hunda, a South Florida key. Traces of heavy oil found while blasting rock for a road-building project, is reported to have been an incentive for acquiring the leases.

ARKANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MILLER COUNTY (Rodessa)—		
Lacy & Riley, Grogan 2, 15-20-28	1128	6025
UNION COUNTY (Schuler)—		
Marine Oil Ce., Fee 4, 17-18-17	1680	7590
Phillips, Marine 1, 20-18-17	1200	7640

*Failures; †Junked; ¶Million cu. ft. gas.

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ROCKY MOUNTAIN FIELDS

Union spots wildcat on Agate anticline, Nebraska.

* * *

Company resumes on Nesson structure, North Dakota.

Casper, Wyo.—Rocky Mountain oil activity showed an optimistic revival with the first week in spring. Bright spots highlighting the Mountain picture include the drilling of two important deep wildcats in western Nebraska, resumption of drilling in California Company's widcat in nothwestern North Dakota, announcement of three new refineries to just about lift the over-production burden from northern Montana fields, and 10 new wells starting in Wyoming, 8 of which are in the Lance Creek field.

Union Oil Company of California has spotted location and is letting rotary contract for Harold Cook 1, CSE SE SE 15-28n-55w, Agate Anticline, Sioux County, Nebraska, 15 miles east of the Wyoming boundary. The company holds a 15,000-acre block covering Agate which is a Tertiary controlled structure with 250 feet of closure. It is an elongated, symmetrical anticline, 15 miles in length, and three miles in width maximum at about the middle of the structure. Agate trends east-west with a strike fault on the northwest flank.

One well has been drilled on Agate, Associated Oil Company's Cook 1, NEc 15-28n-55w, with elevation 4520 feet, drilled to 4554 feet abandoning on November 23, 1921, after it failed to find normally expected thickness in the Wall Creek sands. Hole bottomed 520 feet in the Granerous shale. With development of Basal Sundance and Minnelusa production in the Lance Creek field of eastern Wyoming and equipment for deep drilling structures of western Nebraska have come into notice for testing.

Among these the Harrison structure to the north of Agate has a test planned by L. W. Wickes and associates of Los Angeles. Location has not yet been spotted for the Harrison test. Operator expects to get under way this spring. The Felmont Corporation the past summer made a seismograph survey of the Sanford structure to the south of Agate, and Amerada Petroleum Corporation in the area to the west and south of Agate and Sanford.

North Dakota Test Resumed

California Company is resuming operations in Kamp 1, CNW NE 3-154n-96w, Nesson structure, Williams County, North Dakota. The test shut down the past January at 6747 feet, because of snow and cold weather. Company is preparing to run the 9⅝-inch casing to bottom. The California Company leased fairly solid acreage in a strip 10 miles wide by 30 miles in length extending from a point south of Ray and Tioga towns in Williams County north across the Missouri River to northern McKenzie County. The area was thoroughly seismographed. Development of production in that area would be an important advent in petroleum annals because of the strategic location to the Minneapolis marketing area.

Refineries

William H. McIntyre, Jr. of Salt Lake City, Utah, and president of Wasatch Oil & Refinery Company, has organized the Inland Empire Refineries, and have announced the erection of 2500-barrel cracking plant at Spokane, Washington, which will run on Cut Bank, Montana, crude oil. The company has contracted with the Glacier Production Company (formerly Montana Power Gas Company), one of the larger independent Cut Bank producers, for its crude. The price scale is based on Mid-Continent postings. Rail haul from Cut Bank to Spokane is approximately 400 miles.

Two other refinery deals were reported near completion. William Fulton, pioneer Montana operator, representing interests in the Kevin-Sunburst and Pondera fields, is planning a 2000-barrel plant at Minot, North Dakota. The plant will draw largely from crude produced in the west end of the Kevin field, from Pondera, and small runs from the Cut Bank field. Stanley Gray, Minneapolis capitalist, with production in Kevin-Sunburst through his New Era Fuel Corporation, is interested financially in the Minot refinery.

Harold Hannah, Cut Bank operator, is planning erection of a 1500-barrel plant at Bismark, and has interested

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MOUNTAIN STATES
Completions

MONTANA

Company, Well and Location	Init. Prod. Bbls.	Depth
BIG HORN COUNTY (Hardin Field)—		
Stanley Yerger, Fee 1, lot 10, block 3, 3rd addition to town of Hardin	¶.05	638
A. M. Crilley, Fee 1, lot 4, block 4, 3rd addition to town of Hardin	¶.05	698
FERGUS COUNTY (Lewiston Bench)—		
Flathead-Lewistown Oil Co. 1, cne ne 13-15n-18e	*	1500
FERGUS COUNTY (Lewistown Field)—Structure)—		
Judith Operating Co.'s 2, w nw ne 35-22n-17e	*	3180
TOOLE COUNTY (Kevin-Sunburst Field)—		
Big West Oil Co., Gunderson 5, nw ne nw 19-35n-2w	20	1642

WYOMING

Company, Well and Location	Init. Prod. Bbls.	Depth
CARBON COUNTY (Medicine Bow Field)—		
Ohio-California, Wm. Kyle 4-A, ne ne 26-21n-79w	¶1/10 & 1680	5464
NIOBRARA COUNTY (Lance Creek Field)—		
C. L. Price, Lamb 1, ne nw nw 7-35n-65w	2112	5401
Argo Oil Corp., Ford 6, sw nw 33-36n-65w	1680	5330
Continental, Apex 1, Account 3, se se ne 34-36n-65w	2402	5444
CONVERSE COUNTY (Shawnee Field)—		
New Era Fuel Corp., Brown 1, sw nw sw 25-32n-69w	¶3	865

*Failures; †Junked; ¶Million cu. ft. gas.

with him several Bismark business men. The proposed refinery will run largely on Cut Bank crude.

Yale Oil & Refining Company of Billings, Montana, is meanwhile nearing completion of its 1500-barrel plant at Kallispell, Montana. Five-year contracts, based on Mid-Continent prices, have been signed with Cut Bank independents including, R. C. Tarrant, discoverer of the field, Wm. Fulton, A. C. Jeffries, and others.

Ohio Oil Company is moving in rotary for A. J. Hazlett Estate 3, CNE SW NE 34-23n-79w, Allen Lake gas field, Carbon County, Wyoming, which will be an important test to the Tensleep for oil. Objective formation is expected at 3600 feet. Three gas wells have been completed in the Sundance at Allen Lake, one of which started for the Tensleep but plugged back to Sundance production after drilling into steep dips indicating it was off the subsurface structure. On the southeast end of Allen Lake two other large gas wells have been completed in the Sundance.

In the Big Medicine Bow field, Carbon County, Ohio Oil Company and California Company are moving in rotary for State-D. J. Griffin 3, SE SW NE 36-21n-79w.

In the Lance Creek field four wells got under way while two more locations are up for immediate drilling. A. B. Cobb is running sub-structure for Novick-Ong 3, 200 feet east of the west and 330 feet north of the south lines of the SE SW 6-35n-65w, a north offset to the recent extension completion to the Leo sand, Price's Lamb 1.

Offsetting the Price-Lamb well to the east, Mackinnie Oil & Drilling Company's Thompson 3, (formerly carried as Thompson 4), CNW NE NW 7-35n-65w, is waiting on cement to set around 13⅜-inch casing at 303 feet. Suspended location of Mackinnie in CNW NE NE 7-36n-65w, will later be drilled as Thompson 4, and was formerly carried as Thompson 3.

A quarter mile west and a little north of the Price-Lamb, J. E. (Jack) Manning and associates' Elsie Pecklow 1, SE SE SE 1-35n-66w, important extension test, is rigging up rotary. Well is 350 feet from the south and 200 feet from the east lines of the Section.

Continental Oil Company's Tom Bell 11, SW SW 27-36n-65w, is waiting on cement to set around 13⅜-inch surface string at 352 feet. Deilman 3-A, SE SE SW 6-35n-65w, southeast outpost, is nearing critical depth, drilling anhydrite at 5002 feet. Joss 5, SW NE 6-35n-65w, is drilling shale at 2548 feet.

J. M. Huber's H. & M. 1, NW NE NE 8-35n-65w, which will mark a further outpost, three-eighths of a mile east and an eighth mile south of Continental's Deilman, is moving in rotary.

Argo Oil Corporation's Ford 5, SW SE 33-36n-65w, is drilling at 2225 feet. Ohio Oil Company's Carrie Putnam 10, CSW SE NW 4-35n-65w, is drilling at 1145 feet.

In the North Baxter Basin field, Selegna Oil Company's Union Pacific 1, SW SW 11-20n-104w, Sweetwater County, southwestern Wyoming, is drilling at 4040 feet in the Morrison formation and nearing major objective, the Sundance sand. The well tested water in the Dakota at 3842-3854 feet

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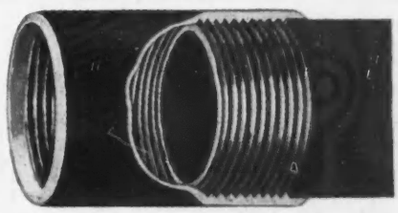

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on drill-stem test. It is an extension well for North Baxter.

Ben W. Stewart and associates resumed operations this week in Darnell 1, NE SE 26-3n-1w, west extension test to the Pilot Butte field, Fremont County, west central Wyoming. Operator is preparing to run the 8¼-inch casing to 875 feet. Objective is the Shannon sand at around 1500 feet.

Use of acid for the first time in the Salt Creek field, Natrona County, materially boosted production for a commercial producer in Stanolind Oil & Gas Company's TP-8, CNW NW 35-40n-79w. Treated with 2000 gallons the well responded from 1 barrel per hour to 17 barrels per hour. Tensleep formation was topped at 3803 feet with total depth at 4011 feet, and 7-inch production string is cemented at plugged depth of 4006 feet through the Tensleep, perforated at porous levels in the sand. Successful use of acid in the Tensleep which is substantially lime cemented at Salt Creek in the TP-8 well is expected to stimulate use of acid in other Tensleep completions in the deep drilling program in the field.

General Petroleum Corporation's Government 1, NW SE 21-35n-77w, wildcat drilling the Cole Creek structure, 13 miles northeast of Casper, was a disappointment in the First Wall Creek sand. Swabbing operations through the tubing from Friday to Thursday brought only nominal amounts of oil, gas and Wall Creek water from the sand at 6680-6840 feet. Though cores carried oil, the sand lacked porosity and permeability for yielding commercial production.

NEW MEXICO

Two Lea County wildcats appear low on structure.

Hobbs, N. M.—Low structural position of two Lea County wildcats situated on a strike between the north end of the Monument field and the Vacuum area forecast dry holes. The 14½-mile interval between the two lime fields has been leased solid for more than a year by large interests on the strength of a favorable geophysical picture. The axis of the geophysical high possibly lies further west, and to test this theory a third prospect for the territory has been started by Continental Oil Company's State 1-I-16, C NW NE 16-18s-35e, situated 3½ miles southeast of the Vacuum field.

Continental Oil Company et al's State 1-G-12, C SE SW 12-18s-35e, 6 miles east by south of the Vacuum area, logged top of anhydrite at 1825 feet, with an elevation of 3887 feet, and was drilling at 3340 feet. It is about 400 feet low on this marker, and maintained this differential on driller's log below this level. Shell Petroleum Corporation's State 1-A, NEc 33-18s-36e, 4½ miles northwest of Monument field, logged first anhydrite at 1863 feet and base of salt at 3132 feet, with an elevation of 3810 feet. Drilling was resumed at 3470 feet after landing intermediate casing string. It is proportionately lower than nearest producers.

Fifteen rigs are in operation at Vacuum, and one third of these will be at the completion stage when The Texas-New Mexico Pipe Line Company places its 8-inch trunk line outlet in service. From one to three direct offsets will be required by 11 of the active tests, all being direct or diagonal offsets to flowing production.

The Texas Company's Corbin 1, 8½ miles west by south of the Vacuum field, has not encountered water in drilling to 4825 feet, or 558 feet below the first oil zone. This wildcat averaged 2 barrels of oil per hour on 16-hour bailing test, lowering the fluid level only 50 feet. It will be carried to water, then plugged back for nitro shot. A small producer is assured.

Lea County gained 7 new projects the past week, including 3 tests for the prolific southwest edge of the Eunice lime field. Operations have been started on Texas Pacific Coal & Oil Company's State 10-A, C SE NE 7-22s-36e, and State 11-A, C W½ SW SW 8-22s-36e. Ohio Oil Company has started State-McDonald 10, C NE SW 16-22s-36e.

Sun Oil Company's Stuart 4, C SE NE 15-25s-37, Langlie sandy-lime field, flowed 128 barrels oil in 15 hours after 70-quart nitro shot at 3310-45 feet. Hole was drilled to 3364 feet. It is on the east edge. Work is under way on Ted Weiner et al's G. A. Smith 1, NE NE NE 4-25s-37e, and Culbertson & Irwin, Inc.'s Humphrey 7-A, NE SW SE 3-25s-37e.

Kan-Mex Oil Corporation's Vaughan-Conoco 2-B, NW NW NW 3-24s-36e, north Cooper area, made 112 barrels per hour initial through ½-inch choke from lime at 3638 feet, or 224 feet subsea. Shell Petroleum Corporation's Whitten 1, NE SW SE 33-23s-36e, northwest edge location, tested gas in the projected oil zone, and was coring below 3705 feet. It has an elevation of 3423 feet. In the Penrose area, W. H. Street et al have made location for Wood 4, C NE NE 22-22s-37e, offsetting small producers.

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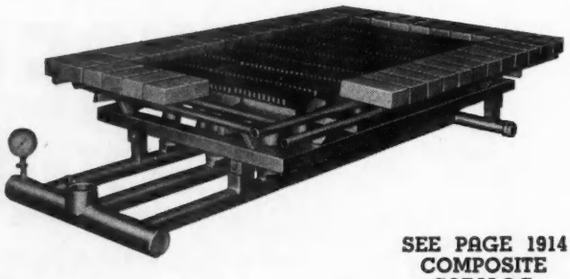

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NEW MEXICO
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
LEA COUNTY (Cooper)—		
Kan-Mex Oil Corp., D. Vaughan-Conoco 2-B, nw nw nw 3-24s-36e	2688	3638
LEA COUNTY (Eunice)—		
Repollo, Roach 4, nw nw sw 21-20s-37e	*	3875
Tide Water Associated, Day 2, c e½ nw nw 6-22s-36e	550	3840
LEA COUNTY (Hardy)—		
Ohio, Hardy 1, ne ne se 20-21s-37e	40	3750
LEA COUNTY (Langlie)—		
Culbertson & Irwin, Alston-Tidal 2, nw sw nw 26-25s-37e	203	3542
Repollo, Stuart 4-D, ne nw sw 10-25s-37e	175	3461
LEA COUNTY (Mattix)—		
McLaughlin et al, Imperial Roy. Co. 1, nw se nw 9-24s-37e	75	3640
LEA COUNTY (Monument)—		
Continental et al, Sanderson 8-A-14, ne nw se 14-20s-36e	1000	3862
LEA COUNTY (Wildcat)—		
Leonard et al, Ginsberg 1, c sw nw 29-25s-37e	*	3735

*Failures; †Junked; ¶Million cu. ft. gas.

CALIFORNIA FIELDS

Continental wildcat deeper than Mt. Whitney is high.

* * *

Second deep zone well at Rosecranz good producer.

Los Angeles.—Because of the extreme depth of Continental Oil Company's KCL-A-2 wildcat near Wasco, Kern County, the crew was unable late last week to make an accurate check on the drift of the hole.

A drift indicator, with clock attachment that would run for only 20 minutes, was dropped down the hole but ceased to operate before bottom was reached. The well is drilling below 14,473 feet in a hard shale formation with no oil or gas showings in evidence, officials stated. During the last 24 hours the drill made 55 feet of formation, while for a corresponding period 24 hours before, the drill made more than 100 feet. Engineers are working on another drill indicator with a clock that will be able to run until bottom is reached, and this new test will be made soon. When the well made a new world record in depth some weeks ago a successful survey of the drift was made and disclosed that the bottom of the hole was only 24 feet off vertical.

Twice this week the company endeavored to run drift indicators to the bottom of this project, but before the indicator reached bottom, the clock-attachment ran out. Field technicians are trying to figure out a new attachment that will make this test possible under adverse conditions.

Another time that present day equipment failed to work satisfactorily occurred when a survey outfit was run in. Officials reported that when the disc with photostat reached a certain depth in the well, the emulsion on the disc melted and made it impossible to obtain a reading. Temperatures encountered exceed 290° F., which increases the difficulties of getting an accurate check on the drift of the hole at present depth.

On Tuesday, the hole passed 14,501 feet, equal to the height of Mt. Whitney, highest mountain in America. Despite the hard shale formation penetrated, the 3½-inch bit in use is making rapid progress, having made something like 240 feet of formation during the past 72 hours. Friday afternoon the well was drilling below 14,629 feet, and the company officially stated that nothing definite has been determined as to when the drill will stop.

This deep project has passed 14,501 feet, which is as deep into earth as Mt. Whitney is high.

1200 Barrels at Rosecrans

Union Oil Company's second deep zone well in the Rosecrans field was placed on production during the week for 1200 barrels of 31.4-deg. gravity oil per day from Miocene at 7630 feet. Gas production was estimated at 900,000 cubic feet, casing pressure being 675 pounds, with 175 pounds tubing pressure. The company's first deep zone test, Rosecrans 16, originally was completed for 1200 barrels daily. Location has been staked for Rosecrans 19, which also will endeavor to develop oil from the deeper zone.

The Petrol Corporation, which recently bought one acre in the heart of the Santa Maria Valley field from the Santa Maria elementary school

CALIFORNIA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ATHENS-ROSECRANS—		
Union, Rosecrans 18	700	7630
BELRIDGE—		
Belridge Oil Co., No. 7	540	8465
GREELEY—		
Standard, Calder-Klassen Comm 1	690	7795
LONG BEACH—		
Hilldon Oil Co., Flood Control 2	650	4180
Richfield, Bixby 4	461	4225
LOST HILLS—		
Argo Pet. Corp., Farnsworth 1A	75	1289
MIDWAY-SUNSET—		
Standard, 35-23-D	240	3817
RICHFIELD—		
Standard, Kraemer 2-26	120	4550
RINCON—		
General Pet. Corp., Ferguson 3	133	3117
RIO BRAVO—		
Superior, Wagner 1	665	11,265
TEN SECTION—		
Shell, KCL A-8	413	8220
SANTA MARIA VALLEY—		
California Lands, Inc., Gallison 3 (no estimate)	1050	5515
Union, Vicente 2	972	4986
York Oil Co., Doane 2	1500	4570
MOUNT POSO—		
Ring Oil Co., Bowles 6	240	1785
TORRANCE—		
Chas. Camp, No. 11	251	5037
VENTURA AVENUE—		
Tidewater Associated, VL&W 41	1295	7303
WILMINGTON—		
Allied Pet. Corp., Allied (LB) 27.. (no estimate)	500	2935
General, Ford (LB) 36	410	3000
Hancock Oil Co., Harbor (LB) E-6	3250	4023
Long Beach Harbor Oil Co., Cedarholm (LB) 2	4750	3790
Richfield Richfield Terminal (LB) 2	221	3026
Texas Co., Refinery Fee 2	189	3472
Westgate Greenland Oil Co., City of L. B. 1	4275	3885
City of L. B. 2	3500	3885

*Failures; †Junked; ¶Million cu. ft. gas.

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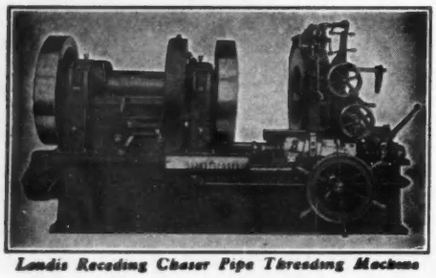

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board for $15,100 cash, intends entering production there.

The acre is situated at the corner of McCoy Lane and Lower Orcutt Road, at one corner of the Frank Mallory property. To the south of it is Union Oil Company's McCoy-Cooney 80-acre lease and to the west the California Lands, Inc., which holds the mineral rights of the MacDonnell tract. Union Oil Company had bid $15,000 for the acre but The Petrol Company picked it up for $100 more.

Shell Oil Company is preparing to drill No. 8-14, Section 14-30-25, in the Canal field, west of Ten Section and it is believed that this project will be a test to the Vedder sand far below the Stevens zone. The location is in the northeast corner of the section, near the Shafter highway. It offsets Standard Oil Company's 80-acre lease where the company's Rio Bravo pumping station is situated, 8 miles to the north.

Santa Maria Location

After several weeks inaction Ohio Oil Company resumed activity in the Santa Maria Valley field when it obtained a permit to drill Morrison 1 on an 80-acre lease south of McCoy Lane and west of Orcutt Road. This project will offset Signal Oil & Gas Company's Ramalho 2 producer, which is situated to the north, and it will be a diagonal offset to Pacific Western Oil Company's Samarin 2 on the Frank J. McCoy forty.

Several major operating companies are increasing activities in zones below the Temblor formation in and near the Coalinga oil field.

Twelve miles to the east Petroleum Securities, operating for three producing organizations, is drilling below the Temblor, seeking Eocene production in Gatchell 2, and is expected to deepen for geological study the old Dana Hogan wildcat, three miles to the south.

In the southwesterly portion of the Coalinga field Shell Oil Company makes a new play on Section 35-20-14. This company already has Conlon 1, a wildcat, down 3000 feet in that area, although no details concerning its geology have been provided. The new well, Section 1-1, is seeking oil formations below the Temblor. The Eocene, productive of high-gravity crude in other valley fields, will be energetically sought at Coalinga this spring.

The critical stage is expected to be reached soon by several wells drilling in the Rio Bravo oil field.

Superior Oil Company is coring below 11,200 feet in Geisinger 1, Section 35-28-25. Ruhl 1, 35-28-25 is coring in shale below 10,965 feet while Wagner 2, 35-28-25 is drilling in shale at 10,720 feet. Union Oil Company KCL 34-2, 34-28-25, is standing cemented with 7⅝-inch casing set at 11,200 feet.

Union Oil Company's Bell 100, an exploratory project that has renewed interest at Santa Fe Springs field because of the possibility of developing production below 9000 feet, has been plugged back to 9945 feet and is flowing by heads. Bottom of the hole is at 11,314 feet.

The possibilities of oil production north of Wasco are at last to be tested by Tide Water Associated Oil Company, which has staked location for Pond 1 near the east quarter-corner of Section 17-26-25, at the southeast end of this vast stretch located between Semitropic gas field and Trico field. This is 5 miles north of Wasco and 4 miles west of McFarland.

On the authority of F. W. Zeah, president of Coast Exploration Company, the oil sand uncovered in the company's wildcat at Coffee Canyon, Section 6-28-28, Kern County, is in the Walker formation and not the Vedder. This oil being the first found in the Walker presents new possibilities in the foothills.

Standard Oil Company's Calder-Klassen 1, Section 20-29-26 in the Greeley field, was completed for 900 barrels per day along with 1,600,000 cubic feet of gas. Although it offsets the Fleishhauer 1 well which yields 60 gravity oil, its oil is 35.2 gravity. Depth is 7750 feet.

Tide Water Associated Oil Company is deepening a number of wells in the Ventura Avenue field. Its Hartmann 18 on the north side of the field is being recompleted at 10,300 feet. This well, after flowing a short time at 100 barrels a day, was killed, deepened a little, and cased off for final completion. V. L. & W. 41, completed several days ago for 1600 barrels a day gross, looks wet and may require recementing. Lloyd 135, on the compressor from 9515 feet, has been a disappointment with an output of 135 barrels. Lloyd 138 is drilling at 9237 feet.

PETROLEUM DICTIONARY

***By* HOLLIS P. PORTER**

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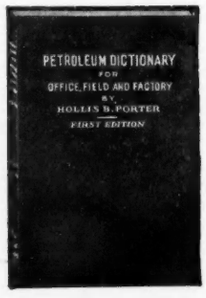

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ILLINOIS DEVELOPMENTS

Richland County McCloskey flows 2400 barrels daily.

Olney, Ill.—One Illinois production record fell and another was threatened last week when Pure Oil Company's C. T. Montgomery B-5, Section 4-3n-9e, Noble Township, Richland County, yielded over 2400 barrels from the McClosky sand in a 24-hour period ending Monday night. It is the largest producer in Richland County and the second largest in the basin area.

The same company's Bunny Travis 1, Section 33-3n-8e, which opened the Clay City field of Clay County last May 5 with an initial production of 2642 barrels, is still the state's record holder. Previous Richland County top well was Pure Oil Company's Palmer-Taylor 2, Section 5-3n-9e, Noble Township, which had an initial production of just 2400 barrels daily. The large producers in the northwest end of the north Noble area are bringing additional extension tests in that direction. Pure Oil Company holds leases on all but a few small tracts in that area.

In the area north of Olney, Gulf Refining Company's L. Pasley 1, Section 27-4n-10e, Olney Township, Richland County, was coring for the McCloskey at 3025 feet, with the well's possibilities expected to be known momentarily. A small amount of saturation, not sufficient for commercial production, was passed through at 2970 feet and there has been considerable gas during recent coring. The Olney area has had several disappointments since completion late in December of Frost et al's Farris 1, pool opener in Section 18-3n-10e, which had an initial of 50 barrels when bottomed at 3065 feet.

Bur Kan Oil Company's Allen 2, Section 27-4n-10e, Olney Township, Richland County, was unsuccessful in removing a stuck drill stem at 3095 feet after more than a week of fishing and was temporarily abandoning plans to test the St. Louis lime formation and the Trenton sands. The well did not find the McCloskv. The rig is being moved across State Highway 130 to Kingwood Oil Company's H. J. Elliott 1, Section 28-4n-10e, Olney Township.

In Wayne County, Benedum & Trees Oil Company's W. Gloyd 1, just west of that company's 50-barrel a day pumper on the Knapp farm, was setting surface pipe. The Texas Company's Silverman 2, Section 16-3s-7e, was pronounced a salt water producer and was being plugged. The No. 1 on this lease is an estimated 500-barrel a day producer from the McClosky.

Adkins Oil Company, Tulsa, announced it would spend $100,000 in prospecting in the area about Du Quoin, Perry County, in southeastern Illinois, with actual drilling to be underway by June 1. The company has a large block of leases around the city and last week was taking leases within the city limits. The council passed an ordinance restricting drilling to one hole to every 10-acre zone, wells to be located on any portion of a residence lot and all property owners within the 10-acre area to share in royalties in proportion to their land holdings. As yet Perry County has not been brought into the current Illinois development program.

Dr. M. M. Leighton, chief of the state geological survey, reported 35 producing wells completed during February, bringing to 230 the number of successful wells in the state's 11 new fields since the current boom began a little over a year ago. Wells in the new fields are adding 800,000 barrels a month to the state's oil production, bringing the total for both old and new fields in excess of 1,128,000 barrels. This compares to monthly production of about 370,000 barrels a year ago, Dr. Leighton said.

ILLINOIS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BOND COUNTY—		
W. C. McBride, Inc., Butler 1	*	1385
CHAMPAIGN COUNTY—		
Casey-Edwards Oil Co., Porterfield 1	¶1.50	1065
CLAY COUNTY—		
Pure, Travis "B" 2	290	3006
J. L. Tallman et al, Nodacker 1	*	3147
CLINTON COUNTY—		
John Pugh, Copple 1	325	1376
Conray et al, Feldman 1	220	1378
Shell, Pitchford 1	167	1365
Buehler 1	99	1382
Criley 3	95	1375
Group Oil Co., Jolliff School Lot 1	120	1376
Paul Henshaw, Coe 1	*	1444
Hawley & Willis, Hughes 1	*	1454
Ohio, Trame 4	*	1005
CRAWFORD COUNTY—		
Ohio, Woodworth 55	10	940
Dinsmoor Oil Co., Reaville 12	7	983
Mahutska Oil Co., Mohler 15	P	983
FAYETTE COUNTY—		
Carter, Dove 1	177	1495
MARION COUNTY—		
W. C. McBride, Inc., Clow 1	*	2001
RICHLAND COUNTY—		
Pure, Montgomery "B" 1	1272	3000
Montgomery "B" 2	1896	3010
Montgomery "B" 3	1770	2950
Palmer-Taylor 8	779	3000
J. O. Coen 9	664	3000
Dora Hedrick "A" 2	544	3000
H. L. Brant 1	159	3000
H. E. Burr 2	150	3000
Anna Snyder 4	124	3000
Papoose Oil Co., J. Lynch 1	*	3124
J. I. Staley, Mitchell Lot 1	*	2576
ST. CLAIR COUNTY—		
Pioneer O&G Co., LaCroix 1	100	472
Lindeman 1	65	523
WABASH COUNTY—		
Myers et al, Zimmerman 1	*	1515
WAYNE COUNTY—		
Pure, Gill 3	*	3080

*Failures; †Junked; ¶Million cu. ft. gas. "P" indicates pressure well.

Austin.—The Texas Railroad Commission has postponed until March 25 its hearing on the sour-gas area of the Texas Panhandle. This hearing will be held in Amarillo, and is to obtain evidence upon which to prepare a sour-gas proration order for that field.

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EASTERN FIELDS

Maxon sand productive in Gilmer County, W. Virginia.

Pittsburgh.—Paul K. Weekley's F. W. Bell 2, between Leading and Sinking creeks, Gilmer County, West Virginia, 8 miles from present production, was showing for 6 barrels of oil a day from the Maxon sand at 1704 feet. Gas pressure was described as fair and the well was to be deepened from its present point 8.8 feet in the sand. The strike is considered important in view of commercial Maxon sand production in the Tanner and Laurel fields to the west.

Potter Development Company, William Snee et al's second deep test on the Summit Hotel lease on Chestnut Ridge, South Union Township, Fayette County, Southwest Pennsylvania, had a gauge of 3,400,000 cubic feet a day from 6757 feet. The well registered the heaviest shut-in pressure of any deep test in the area, reaching 2985 pounds after 8 hours. The test is being deepened.

New Penn Development Corporation announced abandoning Crawford 1, wildcat in Keating Township, Potter County, at 8482 feet. Drilled from 6085 feet with the first heavy duty deep well rotary rig to be brought into Eastern Fields, the well was searching for the White Medina sand, a formation productive of gas and oil in Ohio and of gas in Cattaraugus County, New York. The wildcat encountered several gas pockets, but none sufficient of commercial production. The rotary is being moved to this company's Haupt 1, in West Branch Township, Potter County, which has been drilled to 5700 feet by cable tools.

Peoples Natural Gas Company announced a deep test, which will be the second to be drilled in Eastern Fields with rotary equipment, for the John S. Marshall farm, Penn Township, Westmoreland County, Southwestern Pennsylvania. It will be the first Oriskany test for the Grapeville Anticline and will be drilled by Loffland Brothers, contractors of Tulsa.

In McKean County, Pennsylvania, Minard Run Oil Company completed the sixth flowing oil well in the stray Sliverville sand at 1722 feet, 4 feet in the sand. This pool was opened last August by Niagara Oil Company which now has three flowing wells in the area. Last week's completion was also the company's third. Becker & Williams completed their second gas well from this formation with an initial open flow of 6,000,000 cubic feet. It topped the sand at 1731 feet and was completed at 1735 feet.

Carter Oil Company announced a Posey County, Indiana, wildcat for the Graulich farm, Section 4-7s-14w.

EASTERN FIELDS Completions

OHIO

Company, Well and Location	Init. Prod. Bbls.	Depth
ASHLAND COUNTY—		
Ohio F. G. Co., Parrott 1	¶.50	2935
ASHTABULA COUNTY—		
Gladding et al, Piper 1	¶.03	1700
ATHENS COUNTY—		
D. T. Orndoff, Harrison 1	¶.50	699
COSHOCTON COUNTY—		
Wittmer O&G Co., Scarr 1	*	4232
GUERNSEY COUNTY—		
Jones & Jewell, Spencer 1	¶.17	1320
LICKING COUNTY—		
Wehrle Gas Co., Orr 2	*	1630
MIAMI COUNTY—		
Mid-West Dev. Co., Peterson 1	2	1700
MONROE COUNTY—		
Hill Oil Co., McCaslin 3	*	1625
MORGAN COUNTY—		
Penn Contracting Co., Dawson 1	.13	1560
PERRY COUNTY—		
Weaver Bros., Esselstein 7	6	1185
Gas Prod. Co., Young 1	*	3000
WASHINGTON COUNTY—		
Huen Bros., Eddy 2	10	1110
Schneider O&G Co., Eddy 1	*	1160

KENTUCKY

BUTLER COUNTY—		
Frank Bernier, Willis 2	20	830
HANCOCK COUNTY—		
J. C. Ellis, Smith 11	10	....
Hupp et al, Poole 5	10	560
LEE COUNTY—		
Garrison et al, Johnson 1	15	490
McLEAN COUNTY—		
South Penn Oil Co., Nall 3	75	1468
Kentucky Nat. Gas Co., Shoskley 2	*	1157
OHIO COUNTY—		
Snowden & McSweeney, Peckinpaugh 23	10	....
Harry Hanson, Westerfield 12	10	....
Boyd Patrick, Cole 1	*	695
WAYNE COUNTY—		
J. T. Wilson, Twyford Hrs. 1	25	470

WEST VIRGINIA

CABEL COUNTY—		
R. H. Morris, Morris 1	¶.07	3542
CALHOUN COUNTY—		
Gerwig & Kothe Co., Hardman 15	¶1.30	2050
GILMER COUNTY—		
C. F. Wilson, Kirkpatrick 1	*	1590
LINCOLN COUNTY—		
H. H. Dial, Fee 1	2	1260
MONONGALIA COUNTY—		
J. A. Cummins & R. M. Phillips, Cummins 2	¶.43	3165
PLEASANTS COUNTY—		
Proper et al, Geo. Hashman 1	3	1790
RITCHIE COUNTY—		
Costadon Oil Co., Carpenter 3	*	2170
WETZEL COUNTY—		
Carnegie Nat. Gas Co., Simmons 1	¶1.85	1875

PENNSYLVANIA

ALLEGHENY COUNTY—		
Hope, C. G. Malise 4	¶.04	3911
Wally et al, Hunter 1	¶	....

*Failures; †Junked; ¶Million cu. ft. gas.

West Virginia drilling activity still declining

Charleston, W. Va.—West Virginia drilling activity, as reflected by permits issued by N. P. Rhinehart, chief of the state department of mines, registered the fifth successive monthly decline in February. Permits issued numbered 35, a drop of 11 or 24 percent from the previous month's total of 46, and a decrease of 20 or 36 percent from the 55 granted in the corresponding month a year ago.

The usual seasonal recession in new work is responsible for the decline from 96 permits in October, 78 in November, 55 in December, and the 46 of last month.

February permits by counties are: Cabell 3, Calhoun 1, Clay 1, Doddridge 3, Gilmer 6, Kanawha 5, Lincoln 2, Marshall 1, Monongalia 2, Nichols 2, Pleasants 1, Ritchie 4, Wetzel 1, Wirt 3.

MICHIGAN FIELDS

Road conditions continue to hold up field work.

Mt. Pleasant, Mich.—Mud and closed roads had reduced Michigan drilling activity to about 30 percent normal this week, with little relief expected for another two weeks. Of 210 tests only 62 were active at mid-week.

Interest centered chiefly on Mammoth Producing & Refining Company's Ricket A-1, Section 27-16n-1w, Midland County, west offset to the Edenville play discovery, and first Dundee test in the area following its opening early in February. Ricket A-1 logged Dundee lime at 3750 feet and was cased with 5-inch at 3756 feet. Preliminary checks indicated it was 12 feet lower on the lime than the discovery. Operators planned to drill in before the close of the week if road conditions improved.

Chapman et al's State 1 discovery, which was credited with an estimated 850-barrel potential in Dundee lime when completed, is scheduled to be acidized this week after marked decline in production and well-head pressure.

Of 16 other active tests in the district, at least two are due to reach Dundee testing points by early next week. Both bad roads and a desire on the part of operators to see a few completed tests other than the discovery this week had noticeably cooled off interest in comparison to the first part of the month.

Possibility of a new Traverse limestone field developed this week when H. L. Gentry Engineering Company's Christensen 1, a wildcat SE NW NE, 29-11n-8w, Pine township, Montcalm County, showed. Traverse was logged at 2757 feet and hole bottomed at 2837 feet. Well flowed 60 barrels from open hole the following day and made a second flow after 5-3/16-inch casing was set a day later. Operators are debating whether to acidize with a light charge or drill deeper.

Pure Oil Company was to test the Lower Traverse limestone this week on the Shearer 1, SE SE NE 26-19n-3e, Adams township, Arenac County, after logging a strong oil-gas show through a 2000-foot Berea water column. Operators cased and cemented first of the week to dry up the hole for a test.

Although in a district where several small Upper Traverse lime wells are under production at depths of about 2000 feet, Pure Oil Company had planned to drill through Traverse for an immediate Dundee limestone test. When the show was logged at 2155 feet, a deeper pay zone than heretofore drilled in the play, officials ordered additional testing.

West Michigan operators were confronted with about the same mud conditions on leases and roads as operators in the Ceneral part of the state, resulting in activity being sharply curtailed. Fairly strong plays are shaping up to further develop in Montrey (3n-13w) and Dorr township (4n-12w) both Allegan County, where shallow Traverse wells in wildcat districts recently were completed.

MICHIGAN
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Eureka Dev. Co., Widenfeller 1, ne nw sw 29-4n-12w	210	1615
R. C. Lentz, Allek 1, nw se ne 33-4n-12w	*	1620
Huges Heinig, Lundburg 1, ne sw ne 29-3n-14w	*	1500
S. B. Hood, Wright 1, ne sw sw 9-3n-13w	550	1611
Lentz & Miller, Moomey 1, nw nw se 21-4n-13w	160	1625
GLADWIN COUNTY—		
Kales-Graves, Woodring 2, ne se se 23-18n-1w	500	3598
W. H. Thourlby, Phillips 2, sw ne nw 25-18n-1w	80	3600
M. L. Jorgensen, Foster 3, nw ne nw 26-18n-1w	290	3588
T. F. Caldwell, Hostetler 1, se se ne 27-18n-1w	190	3604
J. V. Wicklund, State Bank 4, nw se sw 16-18n-1e	30	3633
L & S Oil Co., Flory 1, nw nw se 21-18n-1e	*	3649
Franklin Pet. Co., State 1, sw nw sw 8-19n-1e	*	3401
ISABELLA COUNTY—		
Pure, Doyle A2, sw ne se 32-15n-6w	500	3654
J. G. Zabel, Kennedy 1, nw nw ne 25-14n-4w	*	3813
MIDLAND COUNTY—		
Sun, State A-1, n½ se ne 5-16n-1w.	10	3866
MONTCALM COUNTY—		
Socony Vacuum Oil Co., Hansen 1, c n ne ne 22-12n-6w	¶4	1319

*Failures; †Junked; ¶Million cu. ft. gas.

BRUTE STRENGTH

IXL
The Mark of Quality

RUGGED design and construction. Heavy ribs and extra heavy base. Heat treated and hardened helical gears. Low speed shaft of one diameter made of fatigue-resisting steel. Oversized bearings on all shafts. Those are some of the things that have made IXL oil well pumping units the standard in the fields where the going is tough!

There is more than 76 years of precision gear manufacturing experience behind them, too. When you add the policies of careful inspection and rigid testing to these facts there is only one answer—IXL Helical Pumping Reducers are built for oil field service. You should investigate their advantages.

Send for Bulletin 403. It will give you details about the IXL advantages of oil well pumping units.

FOOTE BROS.
GEAR & MACHINE CORPORATION
5309 S. Western Boulevard - Chicago

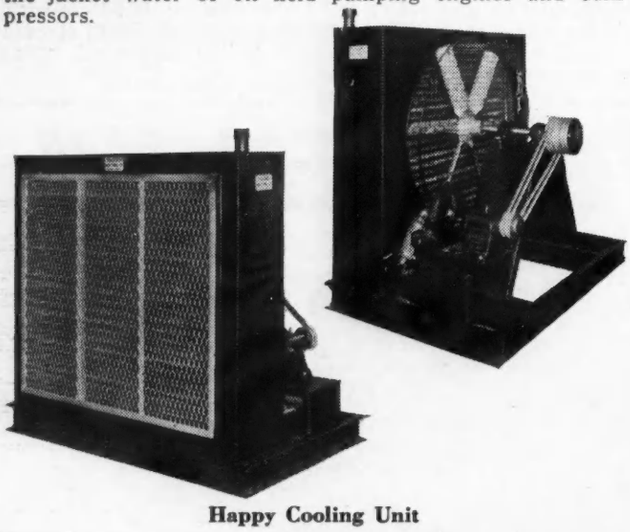
Direct Factory Representatives

MAX E. LANDRY	T. C. GRAHAM	GEORGE J. FIX CO.	J. H. TURNER
204 Terminal Bldg., Oklahoma City, 533 Mayo Bldg., Tulsa, Okla.	Box 596, Overton, Texas	2413 Commerce St., Dallas, Texas	Odessa, Texas

NEW PRODUCTS FOR THE FIELD
Machinery • Tools • Equipment

COOLER
Happy Belting Company

Happy Belting Company, Tulsa, Oklahoma, recently announced a cooler especially designed and built for oil field use to supply the demand for a high-efficiency unit to cool the jacket water of oil field pumping engines and compressors.



Happy Cooling Unit

The complete unit consists of a radiator or core, made up of round heavy-gauge wall seamless copper tubes, tested for leaks at 100 pounds hydraulic pressure. The round tubes eliminate to a great extent clogging under normal conditions. Operating on a closed system, with a minimum of make-up water required, rapid accumulation of scale and foreign matter in engine jackets and piping is eliminated.

A heavy-duty all-steel fan runs on a shaft carried on ball bearings, supplied with a five groove sheave, two of the grooves being used to drive the pump, which is adjustable to take up any slack in the V-Belts. The other three grooves of this sheave are available for driving from shaft of the engine.

Unit may be supplied without front guard, as the flange on the front face of the unit provides means of attaching a duct in order that air may be directed in any desired direction. Suitable connection may be made so that the air can be directed outside in summer and the building cooled, or directed inside and assist in warming the building in winter weather.

The individual parts of the unit are all assembled and mounted on a structural steel-channel base, which may be bolted to a foundation or floor. The outer casing enclosing core is of welded-steel construction, presenting a smooth finished appearance and is easily removable for core inspection and repair, should such be necessary at any time.

WELDING ELECTRODE
Harnischfeger Corporation

Harnischfeger Corporation, Milwaukee, Wisconsin, announces a new Smootharc welding electrode, known as "Harmang" electrode. Designed for welding on parts subject to heavy impact, such as manganese castings, railroad frogs and crossings, dipper teeth, etc., this new electrode supplies the necessary toughness and hardness. Its base metal is nickel manganese steel, ranging from 11 to 14 percent nickel manganese, 3½ to 4½ nickel. Carbon content is in excess of 1 percent.

The slag coating which stabilizes the arc and protects the metal against loss of carbon and manganese is kept to a minimum, so as not to interfere with the rapid cooling required to form an austenitic deposit. With cold working such as hammering and peening, the soft manganese deposit becomes an extremely hard martensite layer which offers great resistance to impact and abrasion. Smootharc "Harmang" operates with the work negative and the electrode positive, and is built in sizes from ⅛ to ¼ inch diameter for use with currents ranging from 90 to 140 amperes.

CEMENT DUMP
Dale Service Corporation

Dale Service Corporation, 3520 Schaeffer Street, Culver City, California, is now marketing the new Dale cement dump, an improved type of bailer bottom specifically designed to dump cement in a well at any desired level without dilution of the cement mix by the well fluid.

The chief advantage to the operator claimed by the manufacturers is that the Dale cement dump has an unusually free dumping action which enables the cement to displace the well fluid without becoming mixed with it, as the bailer is raised. Thus, the cement mix is not diluted or contaminated by the muddy or oily well fluid, and the whole column of cement is said to set up in a very compact mass with uniform and exceptionally high strength.

Dale Cement Dump

Construction of the Dale cement dump is such that the cement emerges from the very bottom of the body, through a hole that is the same size as the full inside diameter of the bailer bottom. There are no valves or orifices inside the body to restrict the flow of the cement out of the bailer, thus the hazard of the cement bridging in the bailer and being later released accidentally as the bailer is being pulled to the surface is eliminated.

The Dale cement dump consists of a tubular body which can be attached to the lower end of a bailer made up of ordinary tubing or casing. The interior of the body is unobstructed by valves, orifices or other restrictions. While being run into the hole the opening in the lower end of the cement dump is closed by a thin disc which is held in place to retain the load of cement by pivoted trip levers attached to the body. The trip levers are actuated by a sliding collar encircling the body, attached to replaceable friction springs of the proper size to contact the wall of the casing or liner in which the cement is to be dumped. This method of dumping enables the operator to trip the mechanism at any point he desires, and prevents accidental dumping while running in the hole.

In operation, the disc is placed in the opening at the bottom of the cement dump body and is held securely by the trip levers. The friction spring assembly is raised on the body against the load of the compression spring and is locked in position by the locking springs. The bailer is then loaded with the proper cement mixture and is run into the hole. As soon as the bailer enters the pipe in which the cement is to be placed, the friction of the friction spring assembly against the walls of the pipe raises the assembly higher on the body and automatically releases the locking springs. When the lower end reaches the level at which the cement is to be placed, the bailer is raised, the friction spring assembly remaining stationary in the pipe due to the wall friction, until the pivoted tripping levers contact the collar. Then they are spread apart and the disc is released from the bottom opening. The bailer is then slowly raised and the cement emerges from the opening in a compact mass, displacing the well fluid. Because there are no valves or orifices in the body, all of the cement is dumped where desired without spudding the bailer. Agitation and mixing of the cement with the well fluid is thus avoided and the cement is neither unduly diluted nor contaminated.

As the tripping mechanism is placed on the body above

WATCHING LIFE BEGIN for an AXELSON PUMP

Skilled hands working with the finest materials fashion the parts for Axelson Pumps. Precision assembly of these parts as depicted here is final assurance that Axelson Pumps will meet every condition for which they are built. Specify Axelson Deep Well Plunger Pumps for any well in any field.

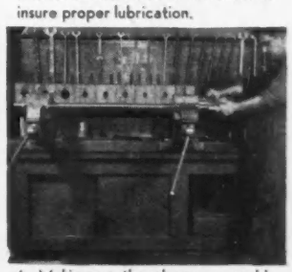
1. Here are the parts for an Axelson R. S. L. stationary barrel type pump, with top-lock hold-down, Perry Barnwell plunger, combined collar and cage, hardened cast iron liners and Axloy seats and balls.

2. The first assembly operation consists of inserting liners into pump jacket. Note that faces of liners are carefully cleaned before inserting.

3. Collars are then loosely screwed into both ends of the pump jacket. Interior of liners is flooded with oil to insure proper lubrication.

4. The mandrel is now inserted through the entire length of the pump jacket, thus bringing the liners into proper alignment.

5. While mandrel is still inserted, collars at each end of jacket are tightened. This maintains proper alignment after mandrel is withdrawn.



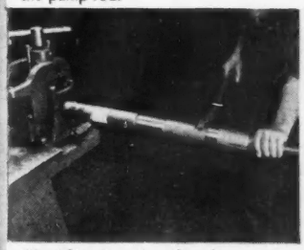
6. Making up the plunger assembly is the next step. The adapter for the pump rod is screwed tightly into the upper end of the plunger.

7. The rod guide is now assembled to the top-lock body. This assembly is then slipped over the pump rod.

8. The pump rod is then tightened into the plunger adapter, and the top-lock body is loosely slipped over the pump rod.

9. Seat and ball is now inserted into the lower end of the plunger and the Perry nut tightened against seat. This completes plunger assembly.

10. The plunger assembly, now complete, is inserted into the pump barrel, which has been properly aligned, as described in No. 4.

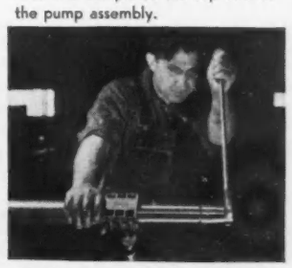


11. After inserting the plunger assembly into pump barrel, top-lock body and rod guide are tightened into top collar of pump barrel.

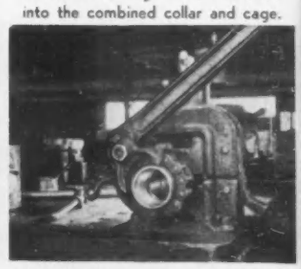
12. Next, the pump rod coupling is securely tightened onto the pump rod. This completes the top end of the pump assembly.

13. It is now necessary to complete the bottom end of the pump. The double valve cage is now screwed into the combined collar and cage.

14. The seat and ball is then inserted into the double valve cage. Seat and ball have been previously vacuum tested for perfect seating.



15. The seat and ball is held into place by the standing valve body. This standing valve body acts as a pilot when lowering pump into well.



16. The locking assembly is now made up and secured by the clamping collar. The pump is now oiled and painted, and boxed for shipment.

AXELSON

DEEP WELL PLUNGER PUMPS

SUCKER RODS

Axelson Manufacturing Company, P. O. Box 98, Vernon Station, Los Angeles • St. Louis • 50 Church Street, New York • Tulsa
Mid-Continent and Eastern Distributor: Frick-Reid Supply Corporation • *Rocky Mountain Distributor:* Great Northern Tool & Supply Company.

the point at which the cement emerges from the bottom, any number of succeeding loads of cement can be dumped without the bailer entering the previously placed cement. Agitation is thus avoided and the whole column is allowed to become a solid, compact, uncontaminated mass when it sets, with uniformly high strength assured.

SMALL-SIZE MUD SCREEN

Link-Belt Company

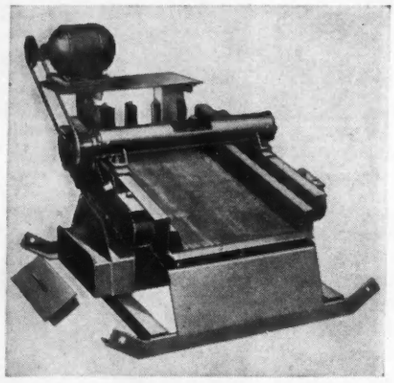
Link-Belt Company, Philadelphia, Los Angeles, Houston, announce that it has perfected and is offering the oil well drilling industry a new small-size improved vibrating screen, known as Type NRM-124, for reconditioning rotary mud.

Among the features of this new screen, the manufacturer has set forth the following:

Clear unobstructed screening deck, measuring 2 feet wide, 4 feet long.

Improved manner of securing stainless steel screen cloth assures uniform tension.

Tubular rubber cushioning of uniformly stretched screen cloth assures dry rejects and maximum life of cloth.



The new small-size Link-Belt vibrating screen. Screening deck measures 2 x 4 feet.

Fully enclosed vibrator unit, and sturdy platform-spring suspension of screen box, which is vibrated uniformly.

Adjustable wing deflectors assure good distribution of mud over screening surface.

Unitized mud tank skidded and complete with motor supports, making for ease in moving screening unit from one location to another.

Trough connection or outlet for screened mud is provided on either or both sides of screen box.

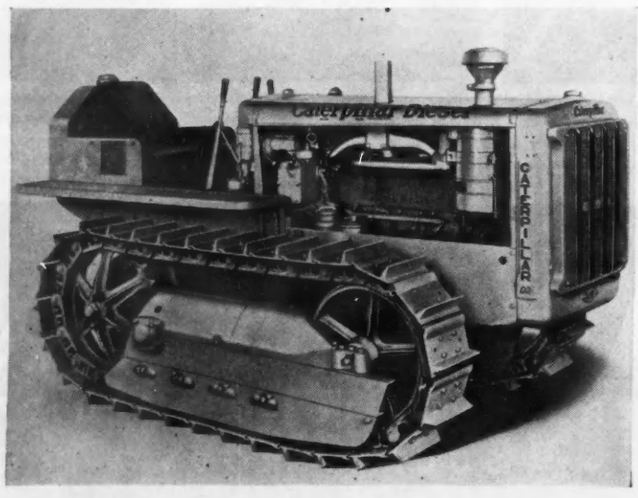
TRACTOR

Caterpillar Tractor Company

Caterpillar Tractor Company, Peoria, Illinois, recently introduced a new track-type tractor, the Diesel D2.

Pulling lighter blade graders, maintenance machines or rotary scrapers the new tractor works on only 1¼ gallons of low-cost fuel an hour, it is claimed by the manufacturer. As a consequence, fuel savings of from 60 to 80 percent may be expected with this machine. In addition, reduced fire hazards through the use of Diesel fuel especially well suits these machines for work around refineries and oil fields.

The Diesel D2 tractor has only three engine operating adjustments—the water pump, the fan belt and the valve clearance. Both the fuel injection pumps and valves are set at the factory, and require no additional field adjustment.



Caterpillar D2 Track-Type Tractor

A unique feature of the Diesel D2 engine is the twin radiator, which has been developed by the company's engineers. One is for cooling the water and the other for cooling the lubricating oil, as oil at the proper temperature insures longer life for the engine bearings.

A hot water manifold on the front side of the fuel filter housing, is an all-weather feature. This keeps the Diesel fuel oil at the proper temperature, regardless of climatic conditions. Positive starting is assured by the use of a 10-horsepower, independent gasoline engine, which cranks the Diesel through a pinion and clutch arrangement. This is similar to the starting method used on all models of "Caterpillar" Diesel tractors.

ELECTRIC SOLDERING UNIT

Ideal Commutator Dresser Company

Ideal Commutator Dresser Company, 1525 Park Avenue, Sycamore, Illinois, recently introduced a new all-purpose thermo-grip soldering unit for all types of soft soldering work. Operating electrically, the unit eliminates the necessity of using an open flame.

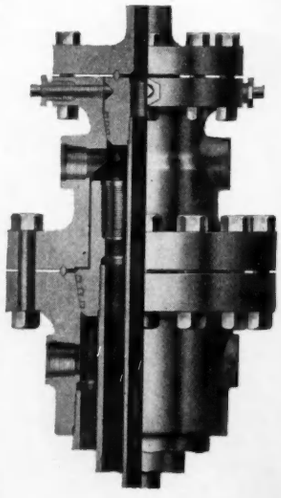
The complete soldering unit consists of a transformer and four heads or tools. All current-carrying parts are fully insulated.

A "midget" type head is especially adaptable for small and lighter soldering and for use in restricted spaces. It is designed for soldering small terminals and lugs up to 150 amp. size, or sweating threadless copper tubing and fittings up to ⅜ inch in diameter. For more common soldering the "standard" type head is recommended. It is designed for applying and removing soldering lugs and terminals up to 400 amp. size, up to 1-inch copper pipes and fittings, making stator connections, heating solder caps, etc.

CASING NEST

Beaumont Iron Works Company

Beaumont Iron Works Company, Beaumont, Texas, has placed on the market an improved casing-tubing head combination for use with pressure control equipment. This new casing nest, designated as type "HZX," is of a full open hole design which permits drilling, running casing, drilling in and running tubing through the assembly.



Blowout preventer equipment flanges directly to the casing head body, sealing off on an A.P.I. steel ring gasket. Inner string of casing is suspended from a tapered hanger which seats in the tapered bowl of the casing head body and packs off on three rings of hydraulic packing. After cementing the inner string, blowout preventer equipment is replaced by the tubing head body as shown in the accompanying illustration. Blowout preventer equipment is then installed on top of the tubing head, the well is drilled in and tubing is run and suspended from a tapered hanger which also packs off in the tubing head body on three rings of hydraulic packing. Four set screws, each provided with a stuffing box, are equally spaced around the circumference of the top tubing head flange, and are made up to engage a slot provided in the tubing hanger and thus hold the tubing in the well against pressure while blowout preventer equipment is removed. A bonnet bolts down on top of the tubing head, a metal ring gasket being provided on top of the tubing hanger to effect a seal. Christmas tree connections are installed on top of the bonnet. The well may be reworked under pressure at any time by sealing the tubing, removing the Christmas tree, installing blowout preventer equipment and releasing the four set screws.

The "HZX" casing nest is tested to 6000 pounds pressure.

This Week with the Industry's EQUIPMENT SUPPLIERS

The Continental Supply Company Opens Two New Branch Stores

The Continental Supply Company, Continental Building, Dallas, Texas, has announced the opening of two additional branch stores.

Illinois operators will be served by an outlet to be established at Centralia, Illinois, under the direction of F. W. George. This store will be in addition to the recently opened facilities at Flora, Illinois.

A new store at Houma, Louisiana, with Thomas J. Holmes, Jr., as store manager, will facilitate the serving of Louisiana Gulf Coast operators. Holmes, who formerly was store manager at New Iberia, Louisiana, is succeeded by J. A. French at that point.

Johnson Manufacturing Company Moves to Houston

Johnson Manufacturing Company, formerly of Shreveport, Louisiana, recently moved its offices and equipment to Houston, being now located at 2211 Preston Avenue.

Industrial Sales and Engineering Reopens at Dallas

Industrial Sales and Engineering Company, 501 Citizens State Bank Building, Houston, recently announced the reopening of its Dallas, Texas, branch, at 2819 Commerce Street, John A. Colemen, formerly of Houston, will be in charge of this branch.

11,634 Feet With a Big Texan Draw Works

A remarkable record for performance and service has been made by a unitized IDECO Big Texan Draw Works owned by Ben (Bud) Coyle and operating near Jeanerette, Louisiana. This rig recently finished a hole which was drilled to 11,634 feet, which is a deep hole for any draw works.

The crew set 9886 feet of 7-inch external upset casing (30-pound). They used 4½-inch drill pipe to 9886 feet, and 3-inch O.D. drill pipe to the bottom. Six active lines were used to 7500 feet, and 8 lines the remainder of the hole.

This draw works has drilled a total of over 300,000 feet of hole. It had drilled over 200,000 feet before it was unitized and equipped with roller bearings, and has drilled over 100,000 feet since that time.

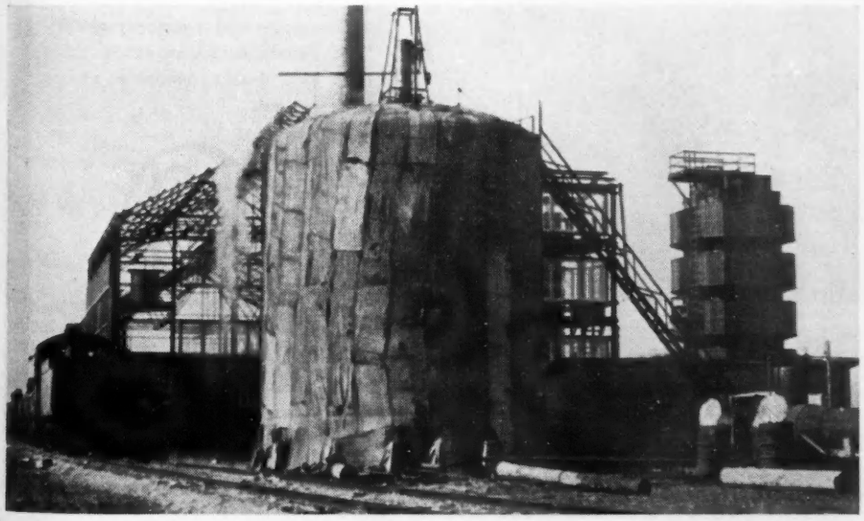
Represents Cincinnati Rubber Mfg. Company in Mid-Continent

Cincinnati Rubber Manufacturing Company announces the appointment of Keel Jones as special representative for the Mid-Continent fields. Jones will have headquarters in Dallas and Fort Worth and will have supervision over the sales of belting, rotary drilling hose and other rubber items manufactured by the company.

World's Largest Hydrochloric Acid Tank Installed in Texas

A 120,000-gallon rubber-lined tank shown recently was installed by Consolidated Chemical Industries at Fort Worth, Texas, and is believed to be the largest ever constructed for hydrochloric acid service. It measures 26 feet in diameter and 25 feet high. The tank is of welded steel plate construction and was lined with a 3/16-inch thickness of Triflex rubber by The B. F. Goodrich Company, Akron, Ohio. This lining offers a 3-ply construction embodying the advantages of both hard and soft

A locomotive was brought into play when a temperature drop made the boiler provided for vulcanizing rubber lining for a 120,000-gallon tank for storage of hydrochloric acid at Fort Worth. Stripped of insulation the outside of the tank is conventional as steel tanks go. Inside it is lined with three sixteenths of an inch of rubber in three plies.



Standco NO-SMOKE

STANDCO BRAKE LINING

Nothing novel—no bunk—but it gets the job done without scoring brake rims. See page 1940, Composite Catalog.

STANDARD BRAKE LINING CO.

YOU DRILL . . . WE'LL FURNISH the MACHINERY and DRILL PIPE . . .

All thoroughly reconditioned in our own shop . . . for SALE or RENTALS. Call or wire for prices.

NEAL LUCEY COMPANY
2107 QUITMAN ST.-PRESTON 9614
HOUSTON, TEXAS

Manufacturing and Accounting Executive

Of 20 years experience in largest Manufacturing and Accounting Firms of the North and East, wishes to associate with a growing Manufacturer of Oil Field Equipment in Houston.

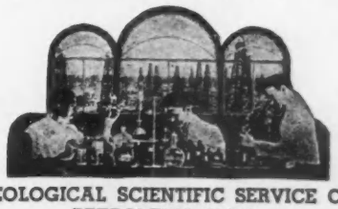
Fully qualified in financial, credit and accounting matters.

Address inquiries to Box 208, Oil Weekly, Houston, Texas.

GEOPHYSICAL SOIL SURVEYS

PERHAPS YOU SHOULD KNOW:

1. That more major concerns use this company's GEOPHYSICAL SERVICE for locating oil than perhaps any other one concern.
2. That although our mistakes are sometimes serious, yet:
3. We can accurately record structural accelerations 5 out of 6 times, and
4. Oil, possibly 6 out of 10 times.
5. By chemical analysis of surface soils.



GEOLOGICAL SCIENTIFIC SERVICE CO.
PETROLEUM BLDG.
FT. WORTH TEXAS

NOTICE: Why Write?

There may be a Field Crew Manager or Traveling Representative already in your vicinity who will courteously answer your questions. He will be in your office in a few hours

by
CALLING COLLECT
STATION TO STATION
2-9888 FT. WORTH, TEXAS
and telling the girl your name and address
(Calls accepted from anywhere on earth)

Pictured here is the new Tyler, Texas, branch office of Schlumberger Well Surveying Corporation, occupied late in February. This new building, located on North Dixie Street, Tyler, is modern in every respect, including air conditioning. Location is adjacent to Schlumberger's truck depot from which the East Texas territory is served. The men, left to right, are: W. J. Lytle, engineer; R. T. Wade, district manager; and C. A. Doh, engineer.

rubber. It is equipped with special built-in expansion joints to prevent cracking or buckling.

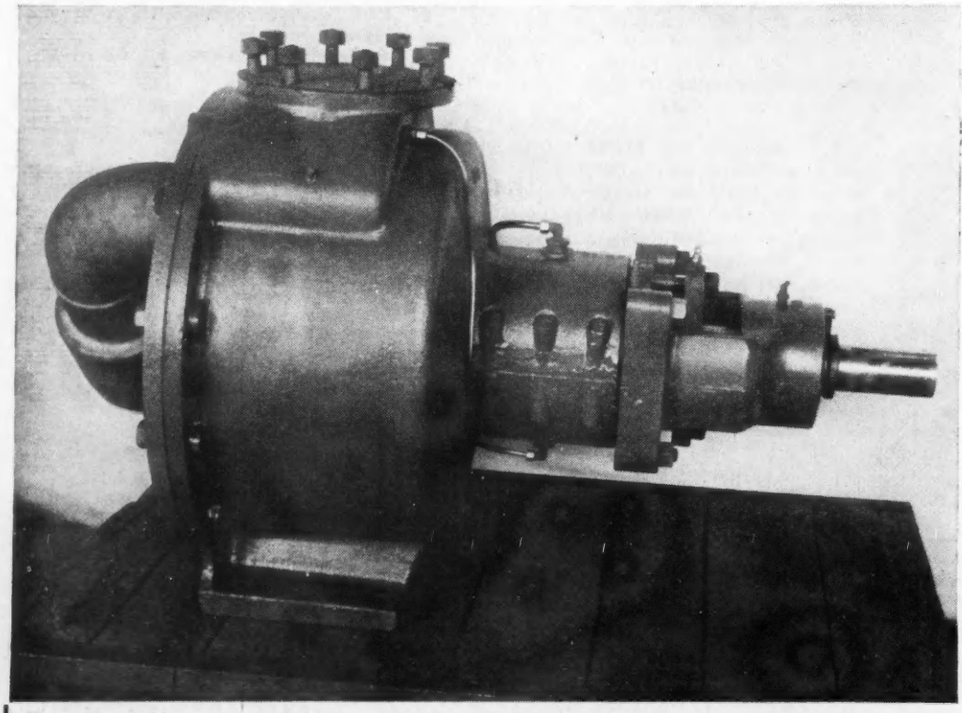
Due to the size of the tank, it was necessary to install the lining in the field. The major problem in this connection was to develop a practical method for vulcanization of the lining. This was accomplished by covering the outside of the tank with fabric to retard radiation, then filling it with water which was brought to the boiling point by injecting live steam. In calculating their steam requirements, it was necessary for engineers to figure the heat radiation loss on the basis of the normal atmospheric temperature for that time of year, which was around 60 degrees. Under these conditions, it was estimated that a single portable boiler could provide all the steam required.

However, about the time vulcanizing had gotten under way, the temperature dropped to about 20 degrees above zero. Naturally, the one boiler could not provide sufficient steam to hold the water at the boiling point under these conditions. But the problem was soon solved by a little fast thinking. A railroad locomotive was run up on the track adjoining where it teamed up with the boiler to supply the necessary steam.

Hercules Supply Opens Houston Store

Hercules Supply Company, Fort Worth, Texas, has opened a supply store in Houston to facilitate a better service to its customers in the Gulf Coast territory. The new store, located at 1121 Rothwell Street, is adequately stocked with oil well, refinery and other oil country specialties.

KENNETH R. PARSONS and Gordon L. Postle left New York on March 5 for Kabul, Afghanistan, where they will be doing geological work for the Inland Exploration Company.



VIKING
IMPROVED PUMP

Especially Designed for Tanker and Barge Service

This pump is a modified Model ER, for handling crude oil or refined liquids, having a 6" suction and a 6" discharge, and a capacity of 750 gallons per minute at 200 rpm. Full details available upon request.

SOUTHERN

DISTRIBUTED BY
SOUTHERN ENGINE & PUMP COMPANY
HOUSTON, DALLAS AND KILGORE, TEXAS

Squeaks from the Bull Wheel

The Lesser Evil

"Your political antagonist is calling you every name he can think of."

"Don't interrupt him. It is better to have a man searching the dictionary for epithets than going after your records for facts."

Foresight

"Is your sister expecting me?"

"Yeah."

"How do you know?"

"She's gone out."

Alert

"Are you a clock watcher?"

"No, I don't like inside work. I'm a whistle listener."

Tsk! Tsk!

A lady and gentleman were being shown through the historic Sultan's Palace in Constantinople by a guide whose English was good but inaccurate in pronunciation. When the party reached the harem, once temporarily occupied by the Sultan's favorite, Empress Eugenie, the guide remarked: "Dees was Empress Eugenie's slipping quarters—dees ees wair she slipped."

No Foolin'

"Johnnie, did you want to leave the room?"

"Say, teacher, you don't think I'm standing here hitch-hiking, do yuh?"

A Marksman!

"Yes, I used to shoot tigers in Africa."

"But there are no tigers in Africa."

"Certainly not. I shot them all."

Baffled!

"Things have sure got me baffled."

"What do you mean?"

"Well, the latest explanation of the financial chaos is that there isn't enough gold in existence to provide backing for the money required and that our trouble is that we have too much gold."

Value of No Crop

Farming must be a great business.

Yeah. The only time a crop is worth anything is when there isn't any of it.

What He's Paying For

"Are you worried about whether I can meet my note next month?"

"Yes, I am."

"Good. That's what I'm paying you six percent for."

Even Stephen!

"It's a great comfort to go back to the home town."

"Just why?"

"You can find out your old chums haven't done so well either."

Lucky

"My wife had a dream last night and thought she was married to a millionaire."

"You're lucky. My wife has dreams like that in the daytime."

Brevity

The Scot stepped into a telegraph office and picked up one of the blanks.

"How much," he asked, "is a telegram to California?"

"Five cents a word for ten words," informed the clerk. "There will be no charge for the signature."

The Scot looked musingly at the the clerk.

"There will be no charge for the signature?" he repeated.

"That's right," reiterated the clerk.

The Scot rubbed his forehead and finally stated:

"Suppose you just send my signature then." The clerk grinned.

"All right," he cried. "I'll do that for you. What's your name?"

"Well," said the Scot, "I may not look it but I'm an Indian and my name is I-Won't-Be-Home-Till-Friday!"

Stop, Stop!

Out in an oil locality a new man was in imminent danger of spraining his back through his frantic efforts to raise a stand of twelve-inch pipe all by himself. The foreman, jealous of his safety record, yelled excitedly, "Hey there, stop! Hey, you, stop! Don't do that! Stop!" Came the calm reply, "Whassamatter, boss? Are you trying to dictate a telegram?"

Asking a Lot

The town Shylock lost his purse containing a sum of money. It was found by an honest man, who advertised for the loser. In time, the advertisement was answered, and the finder, being satisfied that it belonged to the moneylender, cheerfully returned it to him.

The contents of the purse were counted several times, to the discomfort of the finder. "Isn't it all there?" he asked.

"Yes, but you should remember you have had it over a month. What about the interest?"

General Debility

Do you know that the general is sick?

No, what's the matter with him?

Oh, things in general.

Genders and Ganders

"Say, Josh, how can you tell the gander from the goose?"

"Oh, we never bother about that. We just let them run together and work that out for themselves."

Definitions

Woman—A person who can hurry through an aisle 18 inches wide without knocking down piled up tinware and then drive home and knock the doors off a 12-foot garage.

Man—A guy who can see an ankle three blocks away while driving a car down a busy street, but won't notice in the wide open countryside the approach of a locomotive the size of a school house, pulling a string of box cars.

TIME SAVED is Money Earned

Cleaning out time will repay you in increased production. With its powerful suction action the MILLER, quickly at small cost, removes the sand and sediment that clogs free flow of oil.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type. ¼-inch wall tubes HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

- **BAILER BOTTOM** — With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.
- **SAND BOTTOM** — Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM** — Used for cutting the sand loose.
- **CHISEL BOTTOM** (In Pump) — With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Page 1186 COMPOSITE CATALOG

PATENTED NO. 1370340 NO. 1923608 NO. 1707280 NO. 1862628 NO. 1866026 NO. 2035647

MILLER Sand Pump Co.

General Offices and Shop, Box 4516
OKLAHOMA CITY, OKLA., U. S. A.

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SAPULPA, OKLA. and KILGORE, TEX.

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INDEX TO ADVERTISERS

	Page
Abegg Reinhold Co.	—
J. S. Abercrombie Co.	127
Abercrombie Pump Co.	—
The Louis Allis Co.	—
Ajax Iron Works	55
Allsteel Products Manufacturing Co.	—
Alten's Foundry & Machine Works	—
Aluminum Company of America	Third Cover
American Askania Corporation	—
American Assn. of Petroleum Geologists	—
American Cable Division	—
American Cast Iron Pipe Co.	195
American Chain & Cable Co.	—
American Hammered Piston Ring Division of Koppers Co.	82-83
American Iron & Machine Works Co.	—
American Lubricator Co.	—
American Meter Co.	—
American Roller Bearing Co.	59
American Sand-Banum Co.	209
American Seismograph Co.	—
American Steel & Wire Co.	—
Angelus de Anza Hotel	170
Atlas Ball Co.	—
Atlas Supply Co.	89
Axelson Manufacturing Co.	213
Baash-Ross Tool Co.	103
The Babcock & Wilcox Tube Co.	—
Baker Oil Tools, Inc.	Fourth Cover
Baldwin-Duckworth Chain Corp.	14
Barber-Green Co.	—
Baroid Sales Co.	181
William M. Barret, Inc.	210
Bartlett-Hayward Division of Koppers Co.	82-83
Beaumont Iron Works Co.	11
Bethlehem Steel Co.	—
Black, Sivalls & Bryson	—
The Brance-Krachy Co.	—
Braden Steel Corp.	—
Bradford Motor Works	—
Braniff Airways	—
Brauer Machine & Supply Co.	16
The Brewster Co.	—
The Bridgeport Machine Co.	172, 180, 188 and 204
Broderick & Bascom Rope Co.	—
Buckeye Traction Ditcher Co.	170
The Buda Co.	—
Bull-Stewart Equipment Co.	—
Butler Manufacturing Co.	4
A. M. Byers Co.	—
Byron Jackson Co.	121
Jo H. Cable	210
Calmec Manufacturing Co.	—
Cameron Iron Works	60, 61, 62 and 63
Carnegie-Illinois Steel Corp.	—
Carson Machine & Supply Co.	—
J. I. Case Co.	—
Caterpillar Tractor Co.	—
The Cavins Co.	197
Chain Belt Co.	—
The Chemical Process Co.	—
Chiksan Oil Tool Co.	—
Clark Bros. Co.	—
Clark Machine Co.	—
Clayton Manufacturing Co.	—
Climax Molybdenum Co.	—
Columbia Steel Co.	—
Columbian Steel Tank Co.	8
Continental Oil Co.	149
The Continental Supply Co.	114-115
Fred E. Cooper Co.	—
The Cooper-Bessemer Corp.	37
Crane Co.	—
Cummins Engine Co.	7
W. H. Curtin Co.	22
Dallas National Bank	171
Darling Valve & Manufacturing Co.	6
The Dayton Rubber Mfg. Co.	9
C. W. Deming	210
DeWitt Operated Hotels	—
Diamond Chain & Manufacturing Co.	—
W. S. Dickey Clay Manufacturing Co.	—
Dixon Valve & Coupling Co.	—
Dodge Manufacturing Co.	—
Dowell Incorporated	—
E. I. du Pont de Nemours & Co.	—
Eastman Oil Well Survey Co.	85
Economy Electric Lantern Co.	—
Elliott Core Drilling Co.	Second Cover
Emsco Derrick & Equipment Co.	—
Eureka Tool Co.	—
The Fafnir Bearing Co.	—
Geo. E. Failing Supply Co.	—
First National Bank, Houston	—
First National Bank & Trust Co. of Tulsa	154
First National Bank in Shreveport	160
Edwin H. Fitler Co.	—
Fluid Packed Pump Company	18
Foote Bros. Gear & Machine Corp.	211
Fort Worth Clearing House Association	201
The Fort Worth Laboratories	210
The Benjamin Franklin Hotel	208
Franks Manufacturing Corp.	—
Frick-Reid Supply Corp.	94-95
Frost Lumber Industries	164
Gardner-Denver Co.	101
The Garlock Packing Co.	—
Gas Lift Corp.	199
Gaso Pump & Burner Manufacturing Co.	3
General Electric Co.	—
General Motors Corp.	—
General Power Co.	—
Geological Scientific Service Co.	215
Geophysical Service, Inc.	—
Globe Oil Tools Co.	—
The B. F. Goodrich Co.	—
Goodyear Tire & Rubber Co.	—
H. P. Gott Manufacturing Co.	—
Grant Oil Tool Co.	53
Gray Tool Co.	143
Green Head Bit & Supply Co.	109
Grogan Oil Co.	163
Grove Regulator Co.	—
The Guiberson Corp.	41
Gulf Coast Machine & Supply Co.	24
Gulf Envelope Co.	—
Gulf Publishing Co.	118-119 and 206
Gulf States Utilities	—
Gustin-Bacon Co.	—
Halliburton Oil Well Cementing Co.	—
Hardway & Cathey	210
Harrisburg Steel Corp.	—
Harnischfeger Corp.	51
Haynes Stellite Co.	133
Hazard Wire Rope Co.	—
C. M. Heeter, Sons & Co.	—
Hercules Motors Corp.	—
The Hercules Power Co.	—
Hewitt Rubber Corp.	—
Hinderliter Tool Co.	—
Hoard Exploration Co.	—
The Chas. N. Hough Manufacturing Co.	—
Houston Lighting & Power Co.	111
Houston Ready-Cut House Co.	—
Hughes Tool Co.	First Cover and Insert 66-67
Humble Oil & Refining Co.	—
Hunt Tool Co.	192
Hyatt Bearings Division	—
Hydrauger Corp.	—
Hydraulic Pump Co.	158
Independent Exploration Co.	—
The Inferno Co.	200
Ingersoll-Rand Co.	86-87
International Derrick & Equipment Co.	—
International Harvester Co.	35
The International Nickel Co.	167
International Petroleum Exposition	—
International Supply Co.	13
Jarecki Manufacturing Co.	49
Jeffrey Manufacturing Co.	—
Jensen Brothers Manufacturing Co.	205
Johns-Manville	—
M. O. Johnston Oil Field Service Corp.	—
The S. M. Jones Co.	—
Jones & Laughlin Steel Corp.	—
J. & S. Carburetor Co.	—
The Kennedy Valve Manufacturing Co.	—
Kerotest Manufacturing Co.	5
Kesler Manufacturing Co.	—
Kibele Manufacturing Co.	—
Kinzbach Tool Co.	—
Koppers Co.	82-83
Landis Machine Co.	—
Lane-Wells Co.	—
Larkin Packer Co.	—
The Layne & Bowler Co.	137
LeBus Rotary Tool Co.	12
Lee Rubber and Tire Corp.	93
LeRoi Co.	117
A. Leschen & Sons Rope Co.	17
The Lincoln Electric Co.	—
Link Belt Co.	69, 71 and 73
Lion Oil Refining Co.	169
Lone Star Cement Corp.	—
Lucey Boiler & Manufacturing Co.	189
Neal Lucey Co.	215
Ludlow Valve Manufacturing Co.	166
Lufkin Foundry & Machine Co.	78-79
MacClatchie Manufacturing Co.	145
Macwhyte Co.	23
D. S. Mair Machinery Corp.	208
Maloney Tank Manufacturing Co.	159
Manhattan Rubber Division	—
F. G. Masquelette & Co.	—
Martin-Decker Corp.	—
The Medart Co.	—
Merco Nordstrom Valve Co.	—
Merla Tool Co.	—
Metric Metal Works	—
Mid-Continent Supply Co.	7
Midco Bailer Co.	207
Miller Sand Pump Co.	217
Mission Manufacturing Co.	106-107
Lee C. Moore & Co.	—
Morse Chain Co.	—
M & V Tank Co.	—
Murray Rubber Co.	—
Hotel McAlpin	—
McKissick Products Co.	196
National Bank of Tulsa	157
National Lead Co.	181
The National Supply Co.	39
National Tube Co.	—
Naylor Pipe Co.	135
The New Deal Specialty Co.	—
Hotel New Weston	—
Norvell-Wilder Supply Co.	99
Walter O'Bannon Co.	193
O.C.S. Manufacturing Co.	—
Oil Center Tool Co.	—
Oil City Brass Works	—
Oil Well Improvements Co.	191
Oil Well Supply Co.	57
Oklahoma Gas and Electric Co.	129
Osage Metal Co.	—
Otis Pressure Control, Inc.	—
Page Steel & Wire Division	—
Paramount Equipment Co.	—
The Parkersburg Rig & Reel Co.	—
Earl Patterson	156
Patterson-Ballagh Corp.	19
Pelican Well Tool & Supply Co.	203
Pennington Signaling Core Barrel Co.	—
Petroleum Electric Power Club	10
Petroleum Rectifying Co. of California	15
Petty Geophysical Engineering Co.	139
Hotel Philadelphian	—
Pittsburgh Equitable Meter Co.	—
Pittsburgh Steel Co.	—
Hotel Pittsburgher	—
Plowden Supply Co.	113
Portable Rig Co.	105
Preformed Wire Rope	—
Pyramid Manufacturing Co.	—
Raybestos-Manhattan	—
R-F Electrical Manufacturing Co.	—
Reading-Pratt & Cady Co.	—
Rector Well Equipment Co.	—
Reda Pump Co.	—
Reed Roller Bit Co.	74-75 and 97
Republic National Bank	44
The Republic Rubber Division	93
Republic Steel Corp.	90-91
The Rice Hotel	—
Rieber Laboratories	—
The Ridge Tool Co.	162
J. I. Roberts Drilling Co.	156
Rollway Bearing Co.	—
Royal Manufacturing Co.	—
Ryder Scott Co.	—
Jack A. Schley	210
Schlumberger Well Surveying Corp.	—
Second National Bank, Houston	—
Security Engineering Co.	—
Seismograph Service Corp.	—
Shaffer Tool Works	—
Shell	125
Sinclair Refining Co.	—
SKF Industries, Inc.	—
A. O. Smith Corp.	—
E. M. Smith Co.	184
Howard Smith Co.	—
The Sonner Burner Co.	206
South Chester Tube Co.	—
Southern Engine & Pump Co.	216
Southern Pacific Lines	190
Hotel Southland	—
Southwestern Gas and Electric Co.	123
Spang & Co.	22
Spang Chalfant, Inc.	—
Sperry-Sun Well Surveying Co.	141
Standard Brake Lining Co.	215
Standard Pressed Steel Co.	—
Stanley Tools	—
Star Drilling Machine Co.	186
Sterling Engine Co.	—
Stevens Hotel	—
Sullivan Machinery Co.	—
Templeton, Kenly & Co.	—
Texaco Development Corp.	—
Texas Electric Service Co.	—
Texas Electric Steel Casting Co.	65
Texas Iron Works	81
Texas Steel Co.	—
Thermoid Rubber Co.	—
Thornhill-Craver Co.	—
Thornton Tandem Co.	—
The Timken Riller Bearing Co.	—
The Titusville Iron Works Co.	—
Tretolite Co.	—
Triangle Drilling Co.	160
Trimont Manufacturing Co.	—
Trinity Portland Cement Co.	—
Twin Disc Clutch Co.	—
Union Carbide & Carbon Corp.	133
Union Wire Rope Co.	—
Unit Rig & Equipment Co.	—
United Gas Pipe Line Co.	161
United States Rubber Co.	—
United States Steel Corp.	57 and 77
United Supply & Manufacturing Co.	—
Universal Atlas Cement Co.	77
Wailes Dove-Hermiston Corp.	—
Warner & Swasey Co.	—
The Watson-Stillman Co.	—
Waukesha Motor Co.	—
W. L. Webber	198
Well Equipment Manufacturing Co.	—
Westinghouse Electric & Mfg. Co.	—
Wheeling Steel Corp.	—
Wheeling Machine Products Co.	205
The Wheland Co.	—
Wickwire Spencer Steel Co.	—
J. H. Williams & Co.	—
K. R. Wilson	—
Wilson Manufacturing Co.	—
Wilson Pipe Co.	210
Wilson Supply Co.	151
W-K-M Co.	—
The Wood Shovel & Tool Co.	—
Worthington Pump & Machinery Corp.	—
Young Engine Corp.	—
Young Radiator Corp.	—
Youngstown Sheet & Tube Co.	20
Zingery Oil Map Co.	210